AUGUST 2002

BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT DADE COUNTY, FLORIDA

PROPOSED TEST FILL AT MIAMI BEACH USING A DOMESTIC UPLAND SAND SOURCE

ENVIRONMENTAL ASSESSMENT

U. S. ARMY CORPS
OF ENGINEERS
Jacksonville District

DERM
DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P. O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

FINDING OF NO SIGNIFICANT IMPACT

PROPOSED TEST FILL AT MIAMI BEACH USING A DOMESTIC UPLAND SAND SOURCE

BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT DADE COUNTY, FLORIDA

I have reviewed the Environmental Assessment (EA) for the proposed action. This Finding incorporates by reference all discussions and conclusions contained in the Environmental Assessment enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

a. The proposed action would restore a section of severely eroded beach at Miami Beach, Florida thus preventing or reducing loss of public beachfront to continuing erosional forces and preventing or reducing periodic damages and potential risk to life, health and property in the developed lands adjacent to the beach.

b. Measures to prevent or minimize impacts to sea turtles in accordance with Biological Opinions from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be implemented during and after project construction. To protect the manatee, all water-based activities would follow standard manatee protection measures. There would be no adverse impacts to other Federally listed endangered or threatened species.

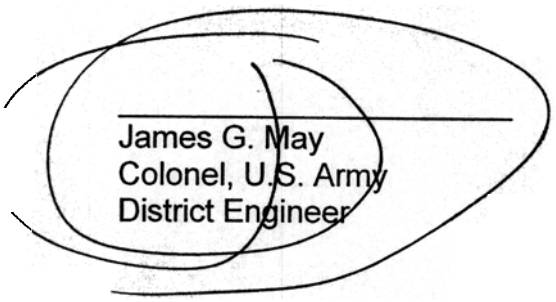
c. Upon reviewing the draft EA, the state has determined that, at this stage, the action is consistent with the Florida Coastal Zone Management Program. Refer to letter dated August 2, 2002 from the Florida State Clearinghouse in Appendix D of the EA. Final consistency will come with the issuance of the state Water Quality Certification.

d. Based on consultation with the State Historic Preservation Officer, no significant historical properties have been identified on the segment of beach proposed for renourishment.

e. Water Quality Certification, pursuant to Section 401 of the Clean Water Act, has been applied for.

f. Measures to eliminate, reduce, or avoid potential impacts to fish and wildlife resources include the following: (1) Extensive turbidity monitoring would be performed at the beach fill site during construction to ensure turbidity levels do not exceed the State water quality standard, (2) Where the discharge pipeline crosses the nearshore hardbottom, collars would be placed along the pipe at 100' intervals to suspend it off the bottom to the greatest extent possible, (6) Any unavoidable impacts to the nearshore hardbottom from the pipeline would be appropriately mitigated as described in the Environmental Assessment.

17 SEPTEMBER 2002
Date



James G. May
Colonel, U.S. Army
District Engineer

ENVIRONMENTAL ASSESSMENT
ON
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DADE COUNTY BEACH EROSION CONTROL
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MIAMI-DADE COUNTY, FLORIDA

1 PROJECT PURPOSE AND NEED

1.1 PROJECT AUTHORITY.

1.1.1 INITIAL AUTHORIZATION.
The Beach Erosion Control and Hurricane Protection (BEC & HP) Project for Dade County, Florida was authorized by the Flood Control Act of 1968 (see Figure 1, Location Map). In addition, Section 69 of the 1974 Water Resources Act (P.L. 93-251 dated 7 march 1974) included the initial construction by non-federal interests of the 0.85-mile segment along Bal Harbour Village, immediately south of Bakers Haulover Inlet. The authorized project, as described in HD 335/90/2, provided for the construction of a protective/recreational beach and a protective dune for 9.3 miles of shoreline between Government Cut and Baker's Haulover Inlet (encompassing Miami Beach, Surfside and Bal Harbour) and for the construction of a protective/recreational beach along the 1.2 miles of shoreline at Haulover Beach Park.

1.1.2 SUPPLEMENTAL APPROPRIATION.
The Supplemental Appropriations Act of 1985 and the Water Resources Development Act of 1986 (Public Law 99-662) provided authority for extending the northern limit of the authorized project to include the construction of a protective beach along the 2.5 mile reach of shoreline north of Haulover Beach Park (Sunny Isles) and for periodic nourishment of the new beach. This authority also provided for the extension of the period of Federal participation in the cost of nourishing the authorized 1968 BEC & HP Project for Dade County, which covered 10.5 miles of shoreline extending from Government Cut north to the northern boundary of Haulover Beach Park, from 10 years to the 50-year life of the project.

1.2 PROJECT LOCATION.

The project is located on the southeast Florida coast within Miami-Dade County. The proposed work would be performed as part of the Dade County BEC & HP Project and is located within the community of Miami Beach (see Figure 1, Location Map).

1.3 PROJECT NEED OR OPPORTUNITY.

The nourishment of Miami-Dade County Beaches has become a necessity to provide storm protection. The purpose of the Dade County Beach Erosion Control and Hurricane Protection (BEC&HP) Project is to reduce the loss of public beachfront to continuing erosional forces and to prevent or reduce periodic damages and potential risk to life, health and property in the developed lands adjacent to the beach.

Offshore borrow sources of beach quality sediment along the Miami-Dade County shoreline have been almost completely depleted, and alternative sources of material will be required in the near future to provide continued renourishment of the Dade County BEC&HP Project. Although carbonate sediment from offshore borrow sites has traditionally been used for project renourishment, sand from upland sources may provide an effective alternative for future renourishment requirements.

1.4 AGENCY GOAL OR OBJECTIVE.

1.4.1 OBJECTIVE
The purpose of the test fill, in addition to providing nourishment to an eroded portion of the Federal project along northern Miami Beach, is to evaluate the economic, engineering, and environmental performance of an upland source of sand on the beach erosion control project.

1.4.2 PROPOSED ACTION
The proposed test fill site would be located along northern Miami Beach, and would extend along approximately 1.5 miles of shoreline that has been an erosional area since the project was constructed. The proposed site is located far from adjacent inlets, and no significant structures exist in this vicinity to disrupt the "natural" coastal processes. The total volume of the test fill is expected to be approximately

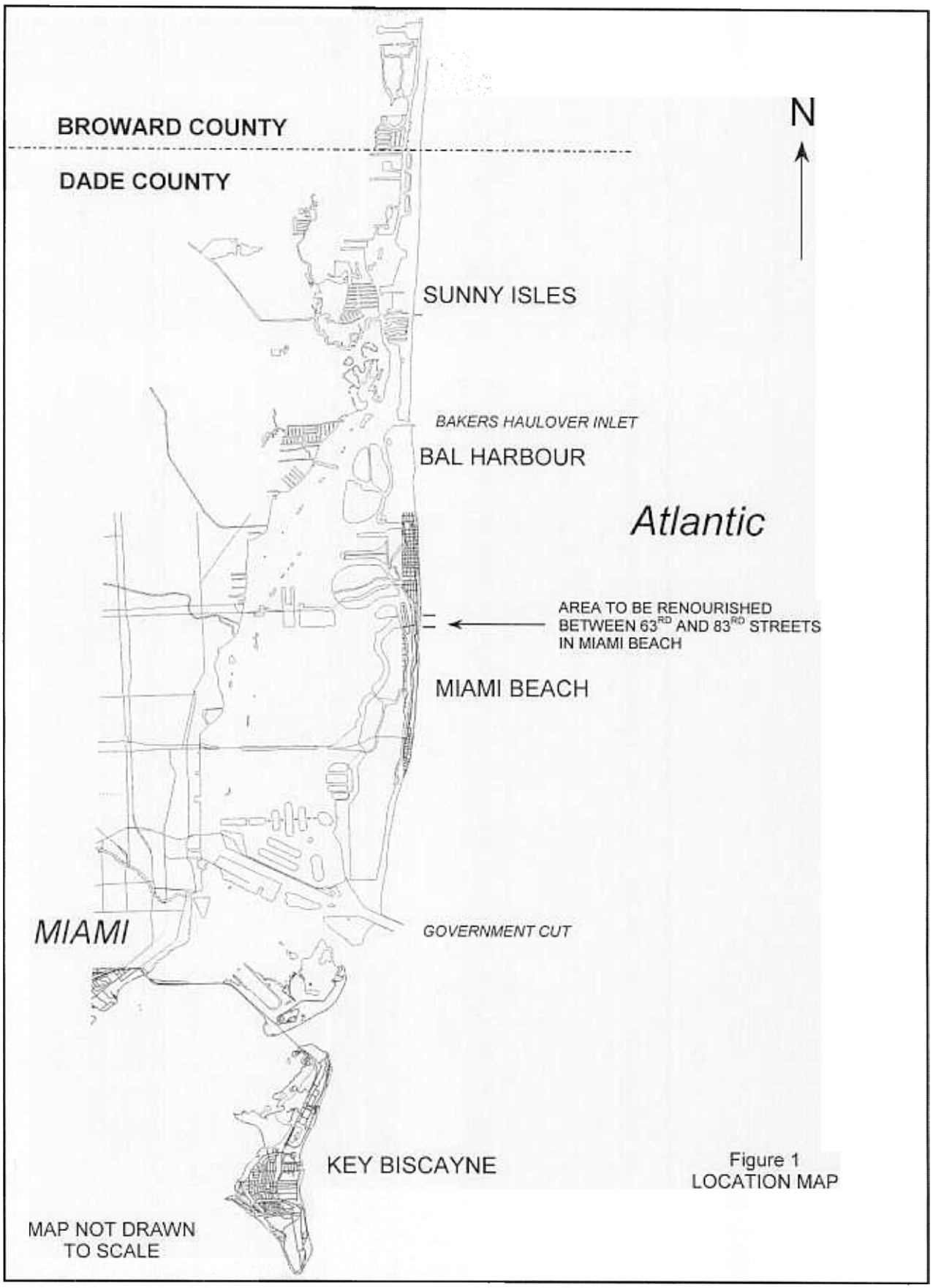


Figure 1
LOCATION MAP

600,000 cubic yards. The proposed location for the test fill is between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47). The exact source of upland sand for the test beach would be determined during the procurement process. Sand sources proposed by contractors would have to meet a set of generic sand specifications (see Appendix A) and pass a screening process for sand characteristics and potential environmental impacts. The beach fill would be constructed at the authorized +9.0-foot mean low water (MLW) elevation with a construction berm width of 205 feet from the erosion control line (ECL) (Figure 2). The front slope of the beach fill will be 1 vertical on 15 horizontal (Figure 3). This project has been previously nourished with the same design as proposed here.

Anticipated direct impacts to the hardbottom habitats are restricted to hardbottom habitats located in the pipeline corridor. This corridor will be the same corridor used for prior beach nourishment projects within the study area. The corridor identified is the one identified to produce the least amount of scarring to hardbottom resources within the area (Miami-Dade County 2000).

1.5 RELATED ENVIRONMENTAL DOCUMENTS.
The following is a list of related documents:

a. Dade County Beaches, Florida, Beach Erosion Control and Hurricane Surge Protection, General Design Memorandum, Phase I. U.S. Army Corps of Engineers, Jacksonville District, 1974.

b. Final Environmental Impact Statement, Beach Erosion Control and Hurricane Surge Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, April 1975.

c. Beach Erosion Control and Hurricane Protection Study for Dade County, Florida, North of Haulover Beach Park, Survey Report and EIS Supplement. U.S. Army Corps of Engineers, Jacksonville District, June 1984.

d. Final Environmental Assessment, Second Periodic Nourishment, Sunny Isles and Miami Beach Segments, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, May 1995.

e. Coast of Florida Erosion and Storm Effects Study, Region III, Feasibility Report with Final Environmental Impact Statement. U.S. Army Corps of Engineers, Jacksonville District, October 1996.

f. Final Environmental Assessment, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Second Periodic Nourishment, Surfside and South Miami Beach Segments. U.S. Army Corps of Engineers, Jacksonville District, April 1997.

g. Final Environmental Impact Statement, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Modifications at Sunny Isles. U.S. Army Corps of Engineers, Jacksonville District, July 1998.

h. Final Environmental Assessment, Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Second Periodic Renourishment, at Bal Harbour. U.S. Army Corps of Engineers, Jacksonville District, May 1998.

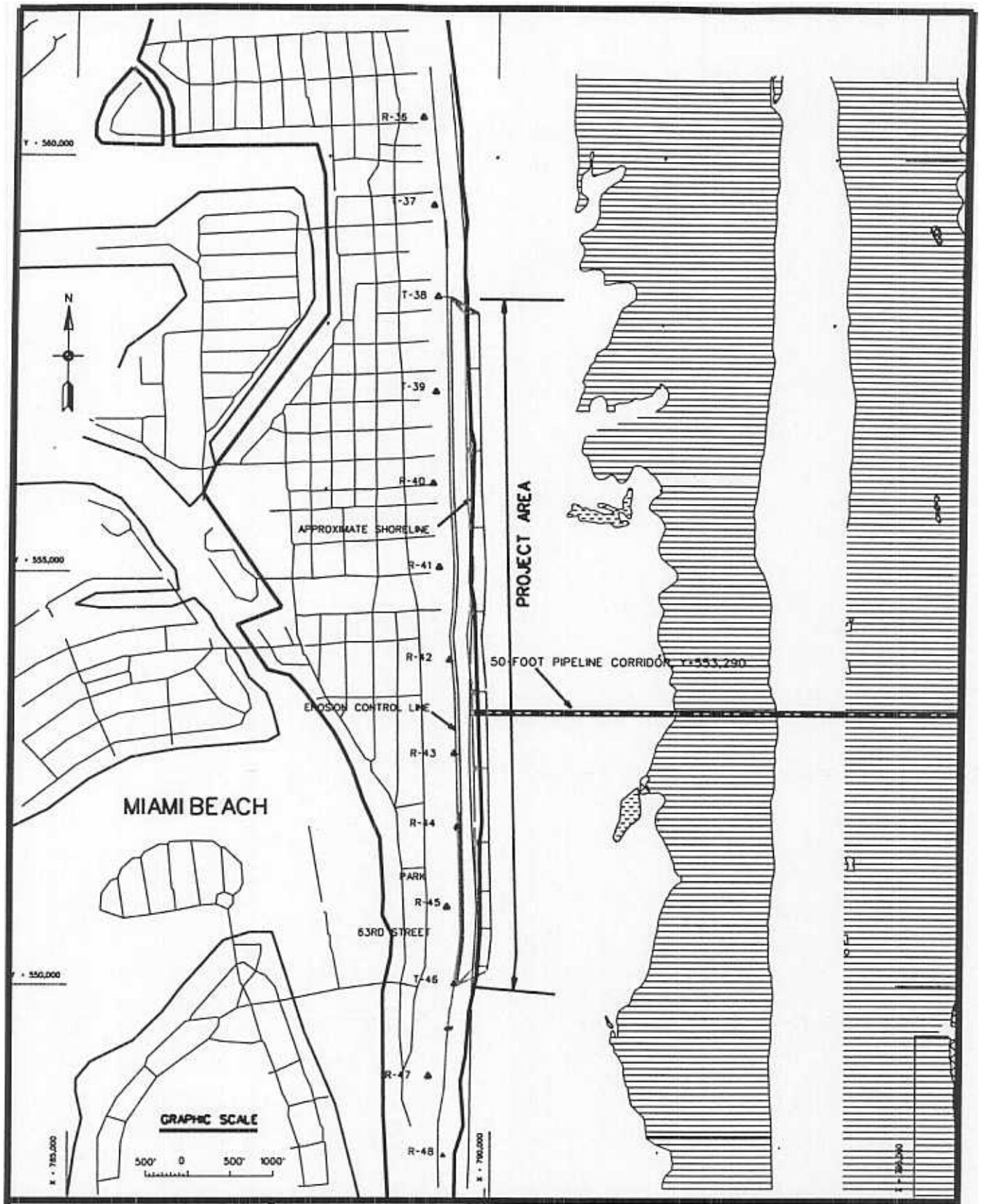
i. Final Environmental Assessment, Renourishment, at Miami Beach in the Vicinity of 63rd Street, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida. U.S. Army Corps of Engineers, Jacksonville District, November 2000.

1.6 DECISIONS TO BE MADE.
The alternatives to provide shore protection for the Miami-Dade County Beaches, from Government Cut north to Bakers Haulover Inlet were evaluated in references 1.5a and 1.5b above. The plan recommended and approved for implementation was beach restoration with periodic renourishment. This Environmental Assessment (EA) will not re-evaluate the alternatives to beach renourishment but will evaluate the use of upland sand as a potential source of beach quality material for the Miami-Dade County Project.

1.7 SCOPING AND ISSUES.
A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for a Test Beach Fill using a foreign source of carbonate sand appeared in the Federal Register on August 21, 1998. In addition, the NOI was mailed to interested and affected parties on October 7, 1998. A correction to this NOI was published in the Federal Register on October 27, 1998. This NOI was cancelled in the Federal Register on February 19, 1999. A new NOI for to prepare a DEIS for a Test Beach using a domestic upland sand source appeared on May 6, 1999 and was mailed to interested parties on May 18, 1999. This NOI was cancelled on May 16, 2002 after it was determined that there were no new significant issues and that an Environmental Assessment would be adequate. Copies of the NOI's and the transmittal letters can be found in Appendix D as well as copies of any letters of comment/response received.

1.7.1 ISSUES EVALUATED IN DETAIL.
The following issues were identified during scoping and by the preparers of this Environmental Assessment to be relevant to the proposed action and appropriate for detailed evaluation:

a. Turbidity and sedimentation impacts to hardground/reef communities.
b. Monitoring of reefs for turbidity and sedimentation impacts.
c. Impacts to hardgrounds from pipeline placement.
d. Potential impacts on nesting sea turtles, nests, and hatchlings.


R-36
T-37
T-38
T-39
R-40
APPROXIMATE SHORELINE
R-41
R-42
EROSION CONTROL LINE
R-43
R-44
PARK
R-45
63RD STREET
T-46
R-47
R-48
MIAMI BEACH
PROJECT AREA
50-FOOT PIPELINE CORRIDOR
GRAPHIC SCALE
500' 0 500' 1000'
N
US ARMY CORPS
OF ENGINEERS
BEACH EROSION CONTROL AND HURRICANE PROTECTION
DADE COUNTY, FLORIDA
SUSTAINABILITY OF RENOURISHMENT
MIAMI BEACH
PROJECT PLAN VIEW
FIGURE 2
DATE:
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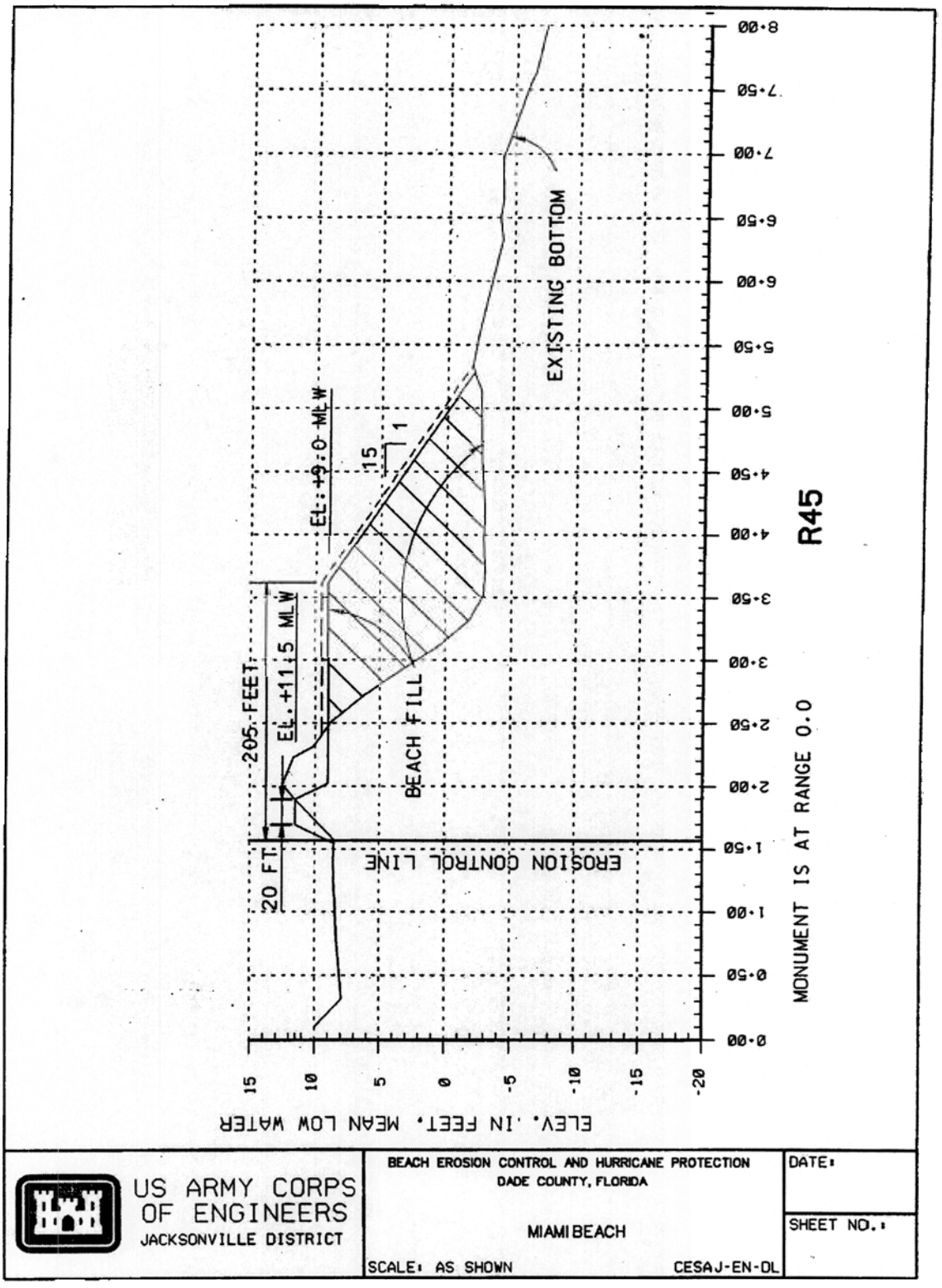

TYPICAL BEACH PROFILE **FIGURE 3**

e. Potential effects on the beach benthic infaunal community.
f. Mitigation.
g. Impacts on historic properties (i.e. historic shipwrecks).
h. Water quality.
i. Recreation.
j. Endangered Species.
k. Essential Fish Habitat (EFH).

1.7.2 IMPACT MEASUREMENT.
The following provides the means and rationale for measurement and comparison of impacts of the proposed action and alternatives.

1.7.2.1 Hardground and Reef Impacts.
Based on extensive experience with beach renourishment in Miami-Dade County and other Florida beaches, impacts to hardground and reefs can be predicted based on proximity, currents, nature of borrow material, buffer zones and other factors. Our desire in selecting an alternative is to keep impacts to these resources to the minimum practicable in consideration of other project requirements. The only impacts to hardground and reef resources will be from placement of the pipeline to transport material to the beach fill area. Pipeline corridors that have been previously identified and utilized will be used to minimize impacts to these resources.

1.7.2.2 Sea Turtles.
Sea Turtle nesting is closely monitored along Miami-Dade County's public beaches. Detected nests are relocated to a safe hatchery. Impacts of compaction and scarps are fairly well established. In addition, continued beach erosion would reduce available nesting habitat. Corrective and mitigative protocols have been established. It is our goal to minimize impacts to sea turtles and to comply with the requirements of the Endangered Species Act.

1.7.2.3 Other Impacts.
Bases for impact measurement and comparison are stated more specifically in section 4.0 on ENVIRONMENTAL EFFECTS and other sections of this document and its appendices.

1.7.3 ISSUES ELIMINATED FROM DETAIL ANALYSIS.
No issues were specifically identified for elimination.

1.8 PERMITS, LICENSES, AND ENTITLEMENTS.

The proposed beach renourishment is subject to the Coastal Zone Management Act. Consultation with the State Historic Preservation Officer (SHPO) is also required. Since there would be a discharge of dredged or fill material into waters of the United States, the proposed Action is subject to Section 404 of the Clean Water Act. In addition the proposed action is subject to Section 401 of the Act for certification of water quality by the state. The U.S. Army Corps of Engineers, Jacksonville District, has submitted an application for a Section 401 Water Quality Certificate (WQC) from Florida Department of Environmental Protection (FDEP).

If conducted during the sea turtle nesting and hatching season, the proposed action will require daily sea turtle nest surveys and nest relocations. A permit from Florida Fish and Wildlife Conservation Commission (FWC) to handle sea turtles and relocate nests will be required for the person(s) performing the surveys and nest relocations associated with the proposed action. For the proposed renourishment at Miami Beach, personnel from the Miami-Dade County Department of Parks and Recreation will be conducting the surveys and nest relocations.

The project sponsor, Miami-Dade County Department of Environmental Resources Management, is responsible for obtaining any real estate easements and rights of way required for this project.

2 ALTERNATIVES

This section describes in detail the no-action alternative, the proposed action, and other reasonable alternatives that were studied in detail. Then based on the information and analysis presented in the sections on the Affected Environment and the Probable Impacts, this section presents the beneficial and adverse environmental effects of all alternatives in comparative form, providing a clear basis for choice among the options for the decision maker and the public.

As previously mentioned in Section 1.6 the alternatives to provide shore protection for Miami-Dade County beaches were evaluated in prior reports. This EA will not re-evaluate the alternatives to beach renourishment but will address the potential impacts associated with constructing a test beach using a domestic upland sand source. This will be compared to the no action alternative.

2.1 DESCRIPTION OF ALTERNATIVES

2.1.1 CONSTRUCT A TEST BEACH USING A DOMESTIC UPLAND SAND SOURCE

Offshore borrow sources of beach quality sediment along the Miami-Dade County shoreline have been almost completely depleted, and alternative sources of material will be required in the near future to provide continued renourishment of the Dade County BEC&HP Project. Although carbonate sediment from offshore borrow sites has traditionally been used for project renourishment, sand from upland sources may provide an effective alternative for future renourishment requirements.

The total volume of the test fill is expected to be approximately 600,000 cubic yards. The proposed location for the test fill is between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47). The exact source of upland sand for the test beach would be determined during the procurement process. Sand sources proposed by contractors would have to meet a set of generic sand specifications and pass a screening process for sand characteristics and potential environmental impacts.

Characteristics of the Material.
For the proposed test fill, the sand must come from a domestic upland source and meet the following physical specifications:

- Composed of quartz and/or carbonate with no more than 20 percent other constituents.
- Average mean grain size greater than or equal to 0.30 mm and less than 0.55 mm.
- Silt content (passing #200 sieve (.074mm)) of less than 5 percent.
- 99 percent of the material must pass 3/8 inch sieve and sand shall contain no material larger than the 3/4 inch sieve.
- Phi Standard Deviation values from 0.50 phi to 2.00 phi.
- Free of debris, sharp rocks and pebbles, concrete rubble, clay and organic material.
- Sand color will be similar to the existing beach. Based on the Munsell Soil Color Chart, color must be within the following range: HUE of 2.5 YR, 5 YR, 7.5 YR, 10 YR, 2.5 Y, 5 Y with a CHROMA of 1, 2, or 3 and a VALUE of 6, 7, or 8. This color specification eliminates strongly colored or dark sand.

Refer to Appendix A for the complete sand specification to be used for this project.

The contractor will determine the best method for material placement. However, material from the upland sand source will most likely be loaded onto barges for placement onto the beach. Barges will be anchored in offshore staging areas previously used for beach nourishment projects. Material for placement will then be pumped via pipeline to the beach. Pipeline corridors utilized will be a corridor previously used to minimize new impacts to benthic communities (Figure 2).

Since the objective of the proposed action is to evaluate the economic, engineering, and environmental performance of upland sand as a source of beach fill material, the only alternative other than no-action, is to construct a test beach.

The proposed test fill site would be located along northern Miami Beach, between 63rd and 83rd Streets in Miami Beach (DNR monuments R-36 to R-47), and would extend along approximately 1.5 miles of shoreline that has been an erosional area since the initial project was constructed. The proposed site is located far from adjacent inlets, and no significant structures exist in this vicinity to disrupt the "natural" coastal processes. The total volume of the test fill is expected to be approximately 600,000 cubic yards.

2.1.2 NO-ACTION ALTERNATIVE (STATUS QUO)

With the no-action alternative, the use of upland sand would not be evaluated as an alternative sand source for renourishing the project. The present condition of erosion would continue along Miami Beach at its present rate. The no-action alternative does not provide the benefits needed to protect the coast from the effects of erosion and storm damage.

2.2 PREFERRED ALTERNATIVE

The test beach would consist of constructing a berm 205 feet from the erosion control line at an elevation of + 9 feet MLW. The slope of the beach fill would be 1 vertical on 15 horizontal (Figure 3). To accomplish this, approximately 600,000 cubic yards of material must be placed on the beach along the 1.5-mile project area (Figure 1). This material is proposed to come from an upland sand source to be determined by the contractor and meeting the criteria set in the sand specifications (Appendix A).

2.3 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION

No other alternatives were considered.

2.4 ALTERNATIVES NOT WITHIN JURISDICTION OF LEAD AGENCY

To the Corps' knowledge, there are no alternatives that are not within the jurisdiction of the lead agency.

2.5 COMPARISON OF ALTERNATIVES

See section 4.0 Environmental Effects for a discussion on the impacts of alternatives.

2.6 MITIGATION

Mitigation for hardbottom impact due to the placement of the discharge pipeline across the nearshore reef would be performed as part of this proposed project. Mitigation would be accomplished by constructing an artificial reef utilizing limestone boulders or prefabricated reef modules, similar to what was conducted for the 1997 renourishment at Sunny Isles and Miami Beach and the 1999 renourishment at Surfside. Section 5.0 Environmental Commitments, discusses other procedures that will be implemented to avoid or minimize potentially adverse environmental impacts.

3 AFFECTED ENVIRONMENT

This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented. This section, in conjunction with the description of the "no-action" alternative forms the base line conditions for determining the environmental impacts of the proposed action and reasonable alternatives.

3.1 GENERAL ENVIRONMENTAL SETTING

The shoreline along Miami Beach is lined with hotels, condominiums, and other commercial establishments. The area is used extensively for recreation.

3.2 VEGETATION

The dune system in Miami-Dade County between Government Cut and Bakers Haulover Inlet is largely artificial and was built as part of the Dade County BEC & HP Project. Dominant plant species in the dune communities include sea grapes, *Coccoloba uvifera*; the beach morning glory, *Ipomoea pes-caprea*; beach bean, *Canavalia rosea*; sea oats, *Uniola paniculata*; dune panic grass, *Panicum amarulum*; bay bean, *Canavalia maritima.* The beach berry or inkberry, *Scaevola plumieri;* sea lavender, *Mallotonia gnaphalodes*; spider lily, *Hymenocalis latifolia*; beach star, *Remirea maritima*; and coconut palm, *Coco nucifera* are also present.

Algal coverage on the offshore hardground areas fluctuates seasonally. The most common algal species observed within southeast Florida offshore hardground areas are *Caulerpa prolifera*, *Codium isthmocladum*, *Gracillaria* sp., *Udotea* sp., *Halimeda* sp., and various members of the crustose coralline algae of the family Corallinaceae. Algal growth is most luxuriant from late July through late October or early November. There seems to be a particular burst or bloom in the macroalgal population in conjunction with the seasonal upwelling that occurs in late July or early August (Smith, 1981, 1983; Florida Atlantic University and Continental Shelf Associates, Inc., 1994).

Seasonally, there is extensive macroalgal growth in the offshore soft bottom areas, with species of green algae (*Caulerpa* sp., *Halimeda* sp., and *Codium* sp.) being particularly abundant in the summer and the brown algal species (*Dictyota* sp. and *Sargassum* sp.) being more abundant in the winter (Courtenay *et al.*, 1974; Florida Atlantic University and Continental Shelf Associates, Inc., 1994). The sea grass *Halophila decipiens* has been observed offshore of Miami-Dade County, but is considered seasonal (April through November) in these offshore soft bottom areas.

3.3 THREATENED AND ENDANGERED SPECIES

3.3.1 SEA TURTLES

Sea turtles are present in the open ocean year-round offshore of Miami-Dade County because of warm water temperatures and hardbottom habitat used for both foraging and shelter. The predominant species is the loggerhead sea turtle, *Caretta caretta*, although green turtles, *Chelonia mydas*; leatherback turtles, *Dermochelys coriacea*; hawksbill turtles, *Eretmochelys imbricata*; and Kemp's ridleys, *Lepidochelys kempii* are also known to exist in the area. All the sea turtles except for the loggerhead are listed as endangered. The loggerhead is listed as threatened.

On the 37.8 miles of beach surveyed within the Miami-Dade County, a total of 505 nests were found in 2001 (FMRI, 2002a,b, & c). Loggerhead nesting in Miami-Dade County occurs from late April through September (Meylan et. al., 1995). The density of nesting along the Miami-Dade County shoreline north of Government Cut is relatively low. The frequency of nesting along the beach at Sunny Isles has ranged from 9 nests in 1989 to 24 nests in 1997 with the highest occurring in 1995 at 35 nests (DERM 1997, unpublished nesting data). The number of false crawls ranged from 44 in 1989 to 24 in 1997. The lowest number of false crawls occurred in 1993 at 7 with the highest occurring in 1989. For Golden Beach nesting ranged from 45 nests in 1987 to 28 nests in 1992 (Meylan et. al., 1995). The highest number of nests for Golden beach occurred in 1991 with 80 nests. The number of false crawls in Golden Beach ranged from 11 in 1987 to 9 in 1992. The highest number of false crawls occurred in 1990 with 17 and the lowest occurred in 1992 with 9. The loggerhead accounts for the majority of the nesting in the county with occasional nesting by green and leatherback turtles. Leatherback turtles may start nesting earlier than loggerheads. In Miami-Dade County the earliest nest documented by Meylan et. al., 1995, was on April 11, 1992. During the sea turtle nesting season, the Miami-Dade County Park and Recreation Department conducts daily surveys (commence on April 1) and relocates nests found along the beach from Sunny Isles south to Government Cut. This is done to prevent poaching or nest destruction due to beach maintenance, emergency vehicles which access the beach and other human related causes (Flynn 1992). All nests found during the surveys are relocated to a central hatchery on Miami Beach (pers.

comm., B. Flynn, Miami-Dade Co. Dept. of Env. Res. Mgmt., 1993). Turtle nests laid on the beach within the Town of Golden Beach are not surveyed by the county and are not routinely relocated, but are allowed to remain on the beach.

3.3.2 WEST INDIAN MANATEE

The estuarine waters around the inlets and bays within Miami-Dade County provide year-round habitat for the West Indian manatee, *Trichecus manatus*. Although manatees have been observed in the open ocean, they feed and reside mainly in the estuarine areas and around inlets. No significant foraging habitat is known to exist in the areas around the project sites, nor have manatees been known to congregate in the nearshore environment within the project area.

3.3.3 OTHER THREATENED ENDANGERED SPECIES

Other threatened or endangered species that may be found in the in the coastal waters off of Miami-Dade County during certain times of the year are the finback whale, *Balaenoptera physalus*; humpback whale, *Megaptera novaeangliae*; right whale *Eubalaena glacialis*; sei whale, *Balaenoptera borealis*; and the sperm whale *Physeter macrocephalus catodon*. These are infrequent visitors to the area and are not likely to be impacted by project activities.

3.4 FISH AND WILDLIFE RESOURCES

3.4.1 BEACH AND OFFSHORE SAND BOTTOM COMMUNITIES

The beaches of southeast Florida are exposed beaches and receive the full impact of wind and wave action. Intertidal beaches usually have low species richness, but the species that can survive in this high energy environment are abundant. The upper portion of the beach, or subterrestrial fringe, is dominated by various talitrid amphipods and the ghost crab *Ocypode quadrata*. In the midlittoral zone (beach face of the foreshore), polychaetes, isopods, and haustoriid amphipods become dominant forms. In the swash or surf zone, coquina clams of the genus Donax and the mole crab Emerita talpoida typically dominate the beach fauna. All these invertebrates are highly specialized for life in this type of environment (Spring, 1981; Nelson, 1985; and U.S. Fish and Wildlife Service [USFWS], 1997).

Shallow subtidal soft bottom habitats (0 to 1 meters [0 to 3 feet] depth) show an increasing species richness and are dominated by a relatively even mix of polychaetes (primarily spionids), gastropods (*Oliva* sp., *Terebra* sp.), portunid crabs (*Arenaeus* sp., *Callinectes* sp., *Ovalipes* sp.), and burrowing shrimp (*Callianassa* sp.). In slightly deeper water (1 to 3 meters [3 to 10 feet] depth) the fauna is dominated by polychaetes, haustoid and other amphipod groups, bivalves such as *Donax* sp. and *Tellina* sp. (Marsh *et al.*, 1980; Goldberg *et al.*, 1985; Gorzelany and Nelson, 1987; Nelson, 1985; Dodge *et al.*, 1991.

Surf zone fish communities are typically dominated by relatively few species (Modde and Ross, 1981; Peters and Nelson, 1987). Fish species that can be found in the surf zone include, Atlantic threadfin herring, *Opisthonema oglinum*; blue runner, *Caranx crysos*; spotfin mojarra, *Eucinostomus argenteus*; southern stingray, *Dasyatis americana*; greater barracuda, *Sphyraena barracuda*; yellow jack, *Caranx bartholomaei*; and the ocean triggerfish, *Canthidermis sufflamen*, none of which are of local commercial value. Most of the fish making up the inshore surf community tend to be either small species or juveniles (Modde, 1980).

3.4.2 REEF/HARDGROUND COMMUNITIES

The classic reef distribution pattern described for southeast Florida reefs north of Key Biscayne consists of an inner reef in approximately 15 to 25 feet (5 to 8 meters) of water, a middle patch reef zone in about 30 to 50 foot (9 to 15 meters) of water, and an outer reef in approximately 60 to 100 foot (18 to 30 meters) of water. This general description was first published by Duane and Meisburger (1969) and has been the basis for most descriptions of hardground areas north of Government Cut, Miami since that time (Goldberg, 1973; Courtenay *et al.*, 1974; Lighty *et al.*, 1978; Jaap, 1984). Development of these three reef terraces into their present form is thought to be related to fluctuations in sea level stands associated with the Holocene sea level transgression that began about 10,000 years ago.

Lighty *et al.* (1978) showed that active barrier reef development took place as far north as the Fort Lauderdale area as late as 8,000 years ago. It is possible that the reefs and hardground areas seen from Delray Beach southward are the result of active coral reef growth in the relatively recent past, whereas the hard bottom features seen north of Palm Beach Inlet may represent the outcropping of older, weathered portions on the Anastasia Formation. The reefs north of Palm Beach Inlet (Lake Worth Inlet) do not show the same orientation to shore as those to the south and the classical "three reef" hardgrounds description begins to differ north of that inlet (Continental Shelf Associates, Inc., 1993).

The composition of hardground biological assemblages along Florida's east coast has been detailed by Goldberg (1970, 1973), Marszalek and Taylor (1977), Raymond and Antonius (1977), Marszalek (1978), Continental Shelf Associates, Inc. (1984; 1985; 1987; 1993), and Blair and Flynn (1989). Although there are a large variety of hard coral species growing on the reefs north of Government Cut, these corals are no longer actively producing the reef features seen there. The reef features seen north of Government Cut have been termed "gorgonid reefs" (Goldberg, 1970; Raymond and Antonius, 1977) because they support such an extensive and healthy assemblage of octocorals. Goldberg (1973) identified 39 species of octocorals from Palm Beach County waters. The U.S. Environmental Protection

Agency (1992) lists 46 species of shallow water gorgonids as occurring along southeast Florida. Surveys by Continental Shelf Associates, Inc. (1984; 1985) identified 33 sponge, 21 octocoral, and 5 hard coral species on offshore reefs off Ocean Ridge and 40 sponge, 18 octocoral, and 14 hard coral species on the offshore reefs off Boca Raton. Blair and Flynn (1989) described the reefs and hard bottom communities off Miami-Dade County and compared them to the offshore reef communities from Broward and Palm Beach counties. They documented a decrease in the hard coral species density moving northward from Miami-Dade County to Palm Beach County. Despite this gradual decrease in the density of hard coral species present, the overall hardground assemblage of hard corals, soft corals, and sponges seen along southeast Florida's offshore reefs remains remarkably consistent throughout the counties of Miami-Dade, Broward, and Palm Beach. Commercially, the most important invertebrate species directly associated with these hardground areas is the Florida lobster, *Panulirus argus*.

Common fish species identified with the reef/hardground communities include grunts (Haemulidae), angelfish (Pomacanthidae), butterflyfish (Chaetodontidae), damselfish (Pomacentridae), wrasses (Labridae), drum (Sciaenidae), sea basses (Serranidae) snapper (Lutjanidae) and parrotfish (Scaridae). Important commercial and sport fish such as black margate (*Ansiotremus surinamensis*), gag (*Mycteroperca microlepis*), red grouper (*Epinephelus morio*), red snapper (*Lutjanus campechanus*), gray snapper (*L. griseus*) Hogfish (*Lachnolaimus maximus*) and snook (*Centropomus undecimalis*) are also associated with these reefs. The precise composition of the fish assemblage associated with any given location along these hardground areas is dependent upon the structural complexity of the reef at that location.

Herrema (1974) reported over 300 fish species as occurring off southeast Florida. Approximately 20 percent of these species were designated as "secondary" reef fish. Secondary reef fish are fish species that, although occurring on or near reefs, are equally likely to occur over open sand bottoms. Many of these species, such as the sharks, jacks, mullet, bluefish, sailfish, and marlin (none of which have significant local commercial value), are pelagic or open water species and are transient through all areas of their range.

3.4.3 ESSENTIAL FISH HABITAT

Habitats within the project area have been designated as Essential Fish Habitat (EFH) as defined in 1996 by amendment to the Magnuson-Stevens Fishery Conservation and Management Act (SAFMC, 1998). EFH for species within the project area include shrimp, snapper-grouper complex (73 species), Spanish and king mackerel, coral and coral communities, and spiny lobster. Various life stages of some of the managed species found in the project area include larvae, post larvae, juvenile, and adult stages of red, gray, lane, schoolmaster, mutton and yellowtail snappers, scamp, speckled hind, red, yellowedge and gag groupers, white grunt and spiny lobster. Categories of EFH that occur within the project area include water column, hardbottom, coral, artificial reef, and open sand habitat. Habitat Areas of Partilcular Concern (HAPC) have also been identified for south Florida. These include hardbottom, coral and coral reef habitats.

3.5 COASTAL BARRIER RESOURCES

There are no designated Coastal Barrier Resource Act Units located in the project area that would be affected by this project.

3.6 WATER QUALITY

Waters off the coast of Miami-Dade County are classified as Class III waters by the State of Florida. Class III category waters are suitable for recreation and the propagation of fish and wildlife. Turbidity is the major limiting factor in coastal water quality in South Florida. Turbidity is measured in Nephelometric Turbidity Units (NTU), which quantitatively measure light-scattering characteristics of the water. However, this measurement does not address the characteristics of the suspended material that creates turbid conditions. According to Dompe and Haynes (1993), the two major sources of turbidity in coastal areas are very fine organic particulate matter and sediments and sand-sized sediments that become resuspended around the seabed from local waves and currents. Florida state guidelines set to minimize turbidity impacts from beach restoration activities confine turbidity values to under 29 NTU above ambient levels outside the turbidity mixing zone for Class III waters.

Turbidity values are generally lowest in the summer months and highest in the winter months, corresponding with winter storm events and the rainy season (Dompe and Haynes, 1993; Coastal Planning & Engineering [CPE], 1989). Moreover, higher turbidity levels can generally be expected around inlet areas, and especially in estuarine areas, where nutrient and entrained sediment levels are higher. Although some colloidal material will remain suspended in the water column upon disturbance, high turbidity episodes usually return to background conditions within several days to several weeks, depending on the duration of the perturbation (storm event or other) and on the amount of suspended fines.

3.7 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE

The coastline within the project area is located adjacent to predominantly residential, commercial and recreational areas. The areas within the project are high energy littoral zones and the material used for nourishment are composed of particles with large grain sizes that do not normally have contaminants adsorbing to them. The nature of the work involved with the renourishment of beaches is such that

contamination by hazardous and toxic wastes is very unlikely. Beach fill materials obtained from upland sources will be screened according to the requirements set forth in the Sand Specifications for Beach Fill (Appendix A). No contamination due to hazardous and toxic waste spills is known to be in the study area.

3.8 AIR QUALITY

Air quality within the project area is good due to the presence of either on or offshore breezes. Miami-Dade County is in attainment with the Florida State Air Quality Implementation Plan for all parameters except for the air pollutant ozone. The county is designated as a moderate non-attainment area for ozone.

3.9 NOISE

Ambient noise around the project area is typical to that experienced in recreational environments. Noise levels range from low to moderate based on the density of development and recreational usage. The major noise producing sources include breaking surf, beach and nearshore water activities, adjacent residential and commercial areas, and boat and vehicular traffic. These sources are expected to remain at their present noise levels.

3.10 AESTHETIC RESOURCES

The project area consists of light sandy beige beaches that contrast strikingly with the deep hues of the panoramic Atlantic Ocean. The eastern foreground consisting of dune vegetation is backdropped by condominium and hotel tropical landscape plantings in many areas. Coconut, sabal, and date palm trees provide vertical human scale transition between the structures and the beachfront. Beachfront plantings of sea oats, dune sunflower, seagrapes, morning glory vines and many other tropical beach plantings provide an aesthetic transition between the remaining dunes and the beach. The project segments consist of moderate to good aesthetic values with few exceptions throughout the entire project.

3.11 RECREATION RESOURCES

Miami-Dade County is a heavily populated county on Florida's Atlantic Coast, which receives a tremendous volume of tourists, particularly during the winter months. Those beaches that can be accessed by the general public are heavily used year round. Those beaches which are associated with condominiums, apartments and hotels have more restricted access for the general public, but receive use from the many visitors who frequent these facilities as well as those members of the general public who walk or jog along the beachfront.

Miami Beach has public access and receives heavy use by swimmers and sunbathers. Adjacent to these beaches are many condominiums and hotels used by long term and short-term visitors and residents of the area. Other water related activities within the project area include on-shore and offshore fishing, snorkeling, SCUBA diving, windsurfing and recreational boating. Most of the boating activity in the area originates from either Bakers Haulover Inlet or Government Cut. Both offshore fishing and diving utilize the natural and artificial reefs located within and adjacent to the project area. Commercial enterprises along the beach rent beach chairs, cushions, umbrellas, and jet skis. Food vendors can also be found along the beach areas. The revenue generated by beachgoers supports a resurgent Miami Beach business district in the project vicinity.

3.12 HISTORIC PROPERTIES

The current project will not impact any cultural resources within the project area. No offshore borrow areas are being utilized for the project. Material placed on the beach may help to preserve cultural resources in danger of being lost due to erosion. It is not believed any cultural resources are present within the fill area, however.

It is assumed that the fill material to be obtained by the contractor will have been obtained from an upland source with no cultural significance.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.1 GENERAL ENVIRONMENTAL EFFECTS

The placement of sand on the beach and within the transition fill area would restore some of the beach's ability to provide protection against storms and flooding. It would also enhance the appearance and suitability for recreation along the beach and would provide additional habitat for threatened an endangered species of sea turtles. Placement of the discharge pipeline across the first reef would impact the associated benthic community including soft and hard corals. Any adverse impacts to the first reef would be appropriately mitigated. If no action is taken, the project beach would continue to erode and shoreline recession would continue.

4.2 VEGETATION

4.2.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

There are no sea grasses or algal communities present in the footprint of the beach fill or the adjacent nearshore areas. No work would be performed on vegetated upland or dune areas. Potential impacts to upland vegetation at the upland borrow site proposed by the contractor may occur. These impacts will not be discussed in this evaluation since upland sand sources will be identified by the contractor. No adverse impacts to either marine or terrestrial vegetation are expected.

4.2.2 NO ACTION ALTERNATIVE (STATUS QUO)

This alternative would have no effect on marine vegetation. However, continued erosion could eventually result in the loss upland vegetation adjacent to the beach.

4.3 THREATENED AND ENDANGERED SPECIES

4.3.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

Beach nourishment and associated activities have the potential to impact sea turtles and may have the following effects.

a. Scarp development leading to hindrance or blockage of accessibility to nesting habitat.

b. Adverse alteration of moisture levels or temperature in beach due to modified nesting material.

c. Compaction and cementation of beach sediments that cause reduced nesting success and aberrant nest cavity construction resulting in reduced nesting and/or hatching success.

d. If carried out during the nesting season, there is a potential for the destruction of nests that are not identified during the daily nest survey and relocation program.

e. Disruption of nesting activities that could lead to poor nest site selection and energetic cost diminishing egg production.

f. Disorientation or misorientation of hatchlings from adjacent beaches by artificial lights on dredge equipment or construction equipment on the beach.

Important physical characteristics of beaches include sand grain size, grain shape, silt-clay content, sand color, beach hardness, moisture content, mineral content, substrate water potential, and porosity/gas diffusion. By using proper management techniques such as nest relocation, tilling of compacted beaches, use of compatible sand, and smoothing of scarp formations, most of the negative effects can be avoided or corrected (Nelson and Dickerson, 1989a). Use of upland sand as beach fill material is not expected to have any long-term effects on sea turtle nesting in the project area. Studies by Nelson et. al, (1999) and Blair et al. (2000) have shown no differences in nest success parameters between sand types.

Artificial lighting along the beach is known to effect the orientation of hatchlings (Dickerson and Nelson, 1989; Witherington, 1991) and to effect the emergence of nesting females onto the beach (Witherington, 1992). If beach nourishment occurs during the sea turtle nesting season, lighting associated with construction activities on the beach may effect hatchlings and nesting females. Research has shown that low pressure sodium (LPS) lights that emit only yellow wavelengths do not attract hatchlings (Dickerson and Nelson 1988 and 1989; Nelson and Dickerson, 1989b). Witherington (1992) demonstrated that LPS lights on the beach did not significantly effect the nesting behavior of green or loggerhead sea turtles. The use of LPS lighting at the beach nourishment site and on the dredge can reduce the potential for lighting effects on sea turtles. However, the Corps is concerned about the appropriateness of using LPS lights in a marine environment for safety reasons. In a letter dated January 29, 1998, the USFWS revised their

requirement for using LPS lights to a recommendation.

4.3.2 NO ACTION ALTERNATIVE (STATUS QUO)

If no action is taken, the beach would continue to erode. If left to erode, this could ultimately result in the loss of sea turtle nesting habitat and/or poor nest site selection. No adverse impacts are expected on other listed species.

4.4 FISH AND WILDLIFE RESOURCES

4.4.1 BEACH RENOURISHMENT USING DOMESTIC UPLAND SAND (TEST BEACH)

During the placement of sand on the beach there may be some interruption of foraging and resting activities for shorebirds that utilize the project area. This impact would be short-term and limited to the immediate area of disposal and time of construction. There would be sufficient beach area north and south of the renourishment sites that can be used by displaced birds while construction takes place. Increased foraging opportunities for some species, such as sea gulls, can also occur as a result of the discharge activity. Elevated turbidity levels within the immediate vicinity of the discharge site may interfere with foraging by sight feeders such as the brown pelican (*Pelecanus occidentalis*). However, increased turbidity levels would be limited to a small portion of the shoreline and should not result in significant impacts to foraging activities.

Nelson (1989c) reviewed the literature on the effects of beach renourishment projects on sand beach fauna and concluded that minimal biological effects resulted from beach nourishment. In addition, some mortality of organisms may occur where grain size is a poor match to existing sediments; however, recovery of the beach system appears to be rapid. Nelson reviewed several studies on the most common beach invertebrates of the southeastern U.S., including the mole crab, *Emerita talpoida*, the surf clam, *Donax sp.*, and the ghost crab *Ocypode quadrata*. None of the studies cited by Nelson showed significant or lasting impacts to any of the above species resulting from beach nourishment. Hackney et al. (1996) provide a more recent review of the effects of beach restoration projects on beach infauna in the southeastern U.S. They also reviewed studies on the above species and agree with the conclusions set forth by Nelson (1989c), with the suggestion that construction should take place in winter months to minimize impacts, and that the sand used should be a close match to native beach sand. In review of past studies, there was a considerable short-term reduction in the abundances of mole crabs, surf clams, and ghost crabs attributable to direct burial. Recruitment and immigration were generally sufficient to re-establish populations within one year of construction. No long-term adverse effects are anticipated to the intertidal macroinfaunal community due to nourishment activities (Deis, et al. 1992, Nelson 1985, Gorzelany & Nelson 1987, USFWS 1997).

Minimal impacts to nearshore hardbottom communities are expected by sand placement (i.e., disposal) on the beach due to the distance of the reefs to the shore. In conjunction with the Coast of Florida Erosion and Storm Effects Study, the hardbottom areas offshore of Miami-Dade County were mapped using side scan sonar. Subsequent aerial photography flown in July 1997 and April 2000 has also been used to map the nearshore hardbottom The closest hardbottom community in the vicinity of the proposed beach fill in Miami Beach is in excess of 1,800 feet offshore.

The communities found offshore of Miami-Dade County out to one-half mile from shore are described in Dodge et al. (1987). Dodge characterizes four community types within this area. (1) non-vegetated sand flats occurring; (2) soft coral communities in sand deposits of 3" to 6" or greater depth; (3) soft coral and attached algae on sand bottom; (4) hard coral community hardground "reefs". Of these community types, only the last one is characteristic of hardbottom reef areas (i.e., continuous rocky substrate with epibiotic growth). The other community types noted by Dodge et al. (1987) have developed and grown in these highly dynamic areas of sand movement, characterized by sporadic, episodic sand inundation and removal. The organisms that colonize these areas are more tolerant of the dynamic conditions that exist in these areas, and comprise a stable community adapted to sand movement of the nearshore system. The community types (2) and (3) above correlate to the hardbottom areas located closest to shore as interpreted by side scan sonar. The hardbottom areas ((4) above) noted by Dodge et al. (1987) were reported as being "never closer than 1500 feet and generally greater than 1800 feet from shore", and that "the hard coral coverage and diversity is greatest on the seaward portions of the transects" (greater than 3000 feet from shore). Because the communities nearest the shore (within 1500 feet) are adapted for periodic sand movement within the zone it is not expected that these communities will be effected by the placement of sand on the beach or the subsequent periodic offshore-onshore movement of that sand. The shoreward edge of the hard coral community described above is at least 1000 seaward of the anticipated equilibrium toe of the beach fill and would not be directly impacted by the sand.

A potential method of placing the sand onto the beach would be to pump it from barges offshore. It may therefore be necessary to place a discharge pipeline across the reef from an offshore pump-out platform to the beach fill site. The placement of the pipeline across the reef would have an impact on the benthic community. Potential impacts included: physical crushing, abrasion and shading of benthos

(algae, sponges, soft coral and hard coral). It is expected that the major impact would occur to sponges, algae and soft corals, with some loss to hard corals. The actual extent of impact would be determined through post-construction surveys.

The substrate located within the footprint of the pipeline will be temporarily impacted by the placement of the pipeline. However, when the pipeline is removed the area will be re-exposed and new benthic populations will begin to quickly establish. Past observations during previous renourishments (Miami Beach 1994; Sunny Isles and Miami Beach 1997; Surfside and South Miami Beach 1999; Sunny Isles and Miami Beach 2001/2002) have shown the pipeline made only occasional contact with the bottom, minimizing the impact by reducing the amount of substrate and number of benthic organisms contacting the pipeline. Post-placement inspection of the pipe found it to be in contact with the reef only sporadically. Irregularities of the reef and the connector collars (or rings) used to connect the pipe segments, held the pipeline off the reef surface for considerable distances. In general, impacts to the bottom were much less than expected. The most severe impacts noted were to large hard coral heads having a colony diameter up to 2.0 m. The most common impact was to erect, dendroid soft corals that bordered the pipeline. These corals were abraded by the constant wave surge moving their branches against the pipeline. The actual impact was considerably less than the pre-project estimated impact. This was the result of several factors. The pre-project evaluation of the reef area over which the pipeline was to be placed provided a 'minimal impact" path for the corridor. In addition, the connector rings for the pipeline segments raised substantial lengths of the pipe off the bottom (between 50 and 100 feet, dependent on localized relief). Finally, the irregularities of the reef itself served as point supports for the pipe, allowing substantial lengths of the pipeline (up to 150 to 200 feet) to remain off the bottom. Although organisms in contact with the pipe (soft corals, sponges and hard corals) were impacted, many of these were saved by the "suspended" pipeline. For the 1999 Surfside and South Miami Beach renourishment, and the 2001/2002 renourishment at Sunny Isles and Miami Beach, the Corps included a requirement in the contract plans and specifications for "collars" to be placed along the pipeline at 100-foot intervals. The contractor elected to use large tractor tires which where slid over the pipeline and secured in place by pieces of chain that were passed through the side-wall of the tire and attached to "eyes" welded to the exterior of the pipe. Underwater surveys of the pipeline indicated that the tires were successful in holding the pipe off the bottom to a much greater extent than seen in previous projects. The same requirement for collars will be included in the contract plans and specifications for this project.

The pipeline corridor that would be used for this project has already been established and was used for the renourishment of Miami Beach in the vicinity of 63rd Street during 2001. The pipeline corridor is permanently marked underwater with concrete blocks cemented to the substrate with the location of the markers determined by differential GPS. This pipeline corridor would be used for future renourishments of Miami Beach. Surface and subsurface buoys can be attached to the blocks that would allow a contractor to place a pipeline along or very near the previous impact path. This would greatly reduce future impacts to the reef because many hard corals in the impact path would have previously relocated and repaired.

Miami-Dade County DERM will implement protection measures prior to and during placement of the pipeline to reduce hard coral and benthic impact associated with placing the pipeline. Any impacts to the first reef from placing the pipeline will be appropriately mitigated. The mitigation would be similar to what was performed for the 1997 Sunny Isles and Miami Beach renourishment and the 1999 renourishment at Surfside and South Miami Beach. Prefabricated modules composed of pre-cast concrete culvert, with limerock grouted to the exterior surface would be placed with a corresponding artificial reef habitat creation-to-impact ratio of 1:1. The area of credit for the artificial reef modules will be the footprint of the module. Similar prefabricated modules were used to mitigate pipeline impacts for the Sunny Isles and Miami Beach and the Surfside renourishments. The actual level of impact to be mitigated will be determined through the evaluation conducted during the post construction pipeline survey. A mitigation plan specific to this project will be developed in coordination with FDEP, DERM, and the Corps.

4.4.2 NO ACTION ALTERNATIVE (STATUS QUO)

The No-Action Alternative would have no impact on fish and wildlife resources within the project area. Continued erosion of the County's beaches could result in continued loss of habitat and eventual loss of vegetated dune habitat. Also, the armoring measures that may be taken by residents along the beaches in these areas would result in impact to the plant and animal communities within these areas.

4.5 ESSENTIAL FISH HABITAT

Implementation of the preferred alternative would not significantly impact EFH resources within the project area. Placement of material on the beach would temporarily impact fishes within the nearshore habitats. Increased turbidity and disturbance during construction may hinder feeding and migration of fishes within these habitats. Due to the relatively small habitat being impacted at one time during the project, and the available adjacent habitats, fishes should be able to utilize these adjacent habitats.

Other impacts include physical damage to the nearshore live/hardbottom and coral habitat within the footprint of the discharge pipeline. Pre and post-construction surveys of the pipeline corridor will be conducted to assess the actual impact. Any impact to the nearshore reef associated with the placement of the pipeline will be mitigated as previously described in the EA. Impacts associated with the beach fill for this project will not result in any long-term significant adverse impacts to EFH within the area.

4.6 COASTAL BARRIER RESOURCES

The purpose of the Coastal Barrier Resources Act is to minimize the loss of human life, wasteful expenditure of Federal moneys; and the damage to fish, wildlife, and other resources associated with the coastal barriers along the Atlantic coast by restricting future Federal expenditures and financial assistance, which have the effect of encouraging development of these coastal barriers. There are no designated Coastal Barrier Resource Act Units located within or adjacent to the project area.

4.7 WATER QUALITY

The proposed action would cause temporary increases in turbidity along and adjacent to the beach disposal site. The State of Florida water quality regulations require that water quality standards not be violated during dredging operations. The standards state that turbidity outside the mixing zone shall not exceed 29 NTU's above background. Results from turbidity monitoring at previous beach nourishment projects have shown that the turbidity did not exceed the standard. Various protective measures and monitoring programs would be conducted during construction to ensure compliance with state water quality criteria. Should turbidity exceed State water quality standards as determined by monitoring, the contractor would be required to cease work until conditions returned to normal. The proposed action has been evaluated in accordance with Section 404 of the Clean Water Act and a 404(b) evaluation report has been included as Appendix B to this EA.

4.8 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

There are no hazardous, toxic, or radioactive waste sites or producers in the project area that would be affected as a result of the preferred alternative. No impacts associated with the disturbance of such sites are anticipated from either the recommended or no-action alternatives. However, use of upland borrow sources would require examination for potential problems with harmful substances. This will involve the screening protocols outlined in the Sand Specification (Appendix A). If these indicate a potential for contamination, we would either try to avoid the potential contamination, look for another site, or consider remediation.

With the use of construction equipment in the in the areas around the borrow and beach fill sites, there is the potential for hydrocarbon spills or other effluent releases. However, the likelihood of significant accidents and releases of this sort is very remote. The contract specifications will require the contractor to develop accident and spill prevention plans. The no-action alternative should not allow conditions to develop that would increase accidents or releases of this sort.

4.9 AIR QUALITY

Direct emissions from the proposed action would be confined to exhaust emissions of labor transport equipment (land and water vehicles), and construction equipment (dredge, barges, tugs, etc.). These emissions would likely be well under the *de minimus* levels for ozone non-attainment areas as cited in 40 CFR 91.853; that is, projects implemented cannot produce total emissions greater or equal to 100 tons per year of Volatile Organic Compounds (VOCs). Any indirect increase in emissions (indirect emissions), as a result of the proposed action is beyond the control and maintenance of the USACE. Consequently, a conformity determination with the Florida State Implementation Plan is inappropriate for increases of indirect emissions from the proposed action. As with the proposed action and alternatives, the no-action alternative will see continued development, which may cause marginal adverse impacts to air quality. The extent of these impacts, however, is difficult to predict.

4.10 NOISE

With the implementation of the proposed action there would be a temporary increase in the noise level during construction. The principle noise would stem from the vicinity of the discharge point on the beach. Construction equipment would be properly maintained to minimize the effects of noise. Increases from the current noise levels as a result of the proposed action would be localized and minor, and limited to the time of construction. There would be no noise related impacts associated with the no-action alternative.

4.11 AESTHETICS

There would be a temporary increase in the noise level during construction, as mentioned above. Engine exhaust fumes would be rapidly carried away by breezes. Any temporary decrease in air quality caused by this work would be corrected once work is completed. Hundreds of feet of dredge pipe lying on the beach or just offshore would have a negative visual impact on the aesthetics of the area. This impact would only be temporary and would be removed along with the pipe at the completion of the work. The negative visual impacts of the equipment and pipe would be offset to an extent by the natural curiosity of some individuals to see what is going on and how work is progressing. There would also be a

temporary increase in turbidity during construction adjacent to the point of discharge. Turbidity would return to normal levels once construction activities cease. Once completed the proposed project would result in an overall improved aesthetic quality. The placement of sand on the beach would restore the natural appearance of the shore. With the no-action alternative, the shoreline would continue to erode. This would result in the loss of existing shoreline, which would reduce the visual aesthetics of the area.

4.12 RECREATION

During nourishment activities, the use of the beach in the vicinity of construction would drop or be restricted temporarily. Use of the beach in the immediate area of the discharge pipe and equipment would be restricted for public safety. Noise from the heavy equipment needed to spread and smooth the sand would disturb some users as well. Many visitors would seek quieter areas for sunbathing or swimming. As portions of the renourished beaches come available, use by the general public would increase once more. After nourishment of the beach, use by the general public and those who stay at the condominiums and hotels would return to pre-erosion activity levels. The general public would be more inclined to use these beaches rather than by-passing them for others with more sand above the high tide line. There would be a temporary adverse effect on recreational fishing in the immediate area of beach fill operations due to construction activities and turbidity. Fishing would not be affected outside the area of immediate construction. Nearshore snorkeling, and SCUBA diving activities may also be impacted by increased turbidity during construction activities and shortly thereafter. Long-term adverse impacts to these water activities are not anticipated. Boat operations may be detoured during construction activities; however, the extent of these detours and time frame of operations render these impacts insignificant. With the no-action alternative, the shoreline would continue to erode. This would eventually reduce the amount of beach available for recreation and would result in the degradation or loss of shorefront property thus, adversely impacting beach recreational opportunities within the area. There would be no construction related impacts to fishing, snorkeling and SCUBA diving

4.13 HISTORIC PROPERTIES

No historic properties have been identified within the area designated for fill. Fill from an upland sand source on the Test Beach should not result in any impact to historic properties. Coordination with the State Historic Preservation Office has been done and is located in Appendix D.

4.14 ENERGY REQUIREMENTS AND CONSERVATION

The energy requirements for this construction activity would be confined to fuel for the dredge, labor transportation, and other construction equipment. The no-action alternative would allow conditions to develop that may endanger coastal property from storm surges and wave erosion during future storm events. On-site preventive measures and post clean up under the no-action alternative would likely demand greater energy than that required of the proposed action.

4.15 NATURAL OR DEPLETABLE RESOURCES

In this case, the beach quality sand used to construct the project is considered a depletable resource. The gasoline and diesel fuel used by the construction equipment is also considered a depletable resource.

4.16 CUMULATIVE IMPACTS

Cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7). Repeated placement of pipeline for periodic nourishment would have a cumulative impact on nearshore hardground habitat. However, using the same corridors for each renourishment to the extent practicable would minimize such cumulative impact. The proposed action would result in long-term benefits, which should outweigh any short-term environmental losses. The cumulative impact of shore protection projects along the Florida coast has been to restore and maintain many beaches which otherwise would have experienced severe erosion or would have totally disappeared. In addition, these activities have reduced property damage and helped maintain property value. Cumulative impacts to EFH for this project would be minimal. The re-utilization of pipeline corridors will minimize hardbottom impacts. Turbidity and distrurbance associated with beach placement will be temporary and no long term impacts to EFH are anticipated.

4.17 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.17.1 IRREVERSIBLE

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. One example of an irreversible commitment might be the mining of a mineral resource. Any impacts to larger hard coral could be irreversible for practical purposes given the long amount of time needed to regrow older and larger specimens. Measures would be taken to try to avoid such impacts and the mitigation plan calls for efforts to move, reattach, or otherwise salvage as much hard coral that might be damaged as possible.

An additional irreversible commitment is the removal of beach fill material from the upland sand source. The removal of this material would constitute an irreversible act. The energy and fuel used during

construction would also be an irreversible commitment of resources.

4.17.2 IRRETRIEVABLE

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. An example of an irretrievable loss might be where a type of vegetation is lost due to road construction. Impacts from the placement of the pipeline which are temporary (soft corals, sponges, small hard corals, benthic invertebrates, etc.), would be an irretrievable loss of that resource for the period of time it takes to recover.

4.18 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

Those species that are not able to escape the construction area are expected to recolonize after project completion. There would be an unavoidable reduction in water clarity and increased turbidity and sedimentation. This would be limited to the immediate areas of the beach fill operation. This impact will be temporary and should disappear shortly after construction activities cease. There would also be unavoidable impacts to hardground benthic organisms due to placement of pipelines across the nearshore reef. Measures will be implemented to minimize these impacts and any impacts that do occur will be mitigated.

4.19 LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY

We recognize that protection of the shoreline is a continual effort. No acceptable and permanent one-time fix has been identified. Using periodic renourishment is an ongoing effort. Renourishment efforts have a temporary and short-term impact on the biological resources on and near the shore. This project will not effect offshore borrow area resources since material for placement is to be obtained from upland sources.

4.20 COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES

The proposed action would be consistent with the state's Coastal Zone Management plan (see Appendix C on consistency determination). We expect the preferred alternative to be consistent with Federal, State and local plans and objectives.

4.21 CONTROVERSY

In recent years, resource agencies, scientists and some environmental organizations have expressed concern about the impact of beach restoration and maintenance activities on nearshore resources. The controversy tends to involve issues relating to the duration or permanency of the impact and the capacity of the resource to recover from perturbations caused by beach restoration activities; and the cumulative effect of multiple but unrelated projects in a region of the coast.

In response to this controversy, the USACE has subjected the regulatory compliance determination for the Miami-Dade Test Beach Project, to full review under the National Environmental Policy Act (NEPA). While public concern for impacts to nearshore habitats cannot be fully alleviated simply by analysis in an Environmental Assessment, the issues of concern will be more closely examined and the sufficiency of measures to avoid, minimize, and mitigate for impacts to resources can be better examined.

In addition, the proposed renourishment involves features not previously used in Miami-Dade County. The large-scale placement of material from upland borrow sites has not previously been utilized in beach nourishment projects within Miami-Dade County. The lack of potential borrow areas within the confines of Miami-Dade County requires that other sources of beach quality sand be utilized to protect both the environmental, private, and commercial resources located within the study area. With careful screening of potential borrow material before placement on the beach and monitoring of effects post placement, success for upland borrow areas can be judged.

4.22 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS

Restoration of eroding sandy shorelines through periodic placement of sand from offshore borrow areas is a long established practice in Florida and in the region of the Miami-Dade County Test Beach Project. Consequently, with respect to the means and methods for constructing the project, general performance of the beach nourishment, and expected range of impacts, there are few if any risks that are uncertain, unique, or unknown. Burial of features along the shoreline within the fill template is a clear unavoidable impact if the beach is to be restored. What is not fully certain is the extent to which burial of these features, which have only been exposed by shoreline retreat in the last 50 years, will have long-term impact on the environment.

4.23 PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS

If the proposed action performs as expected, further use of these features could be indicated for Miami-Dade County and other coastal areas. A lack of sand borrow sources requires the need to locate and utilize other borrow area resources. Should the upland material perform as expected use of upland sand sources for other beach nourishment projects for Miami-Dade County may be warranted. Investigation of other potential upland or foreign sand sources may also be investigated.

5 ENVIRONMENTAL COMMITMENTS

The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

(1) Inform contractor personnel of the potential presence of sea turtles and manatees in the project area, their endangered status, the need for precautionary measures, and the Endangered Species Act prohibition on taking sea turtles, manatees and other threatened or endangered species.

(2) Take precautions during construction activities to insure the safety of the manatee. To insure the contractor and his personnel are aware of the potential presence of the manatee in the project area, their endangered status, and the need for precautionary measures, the contract specifications would include the standard protection clauses concerning manatees. The contractor would instruct all personnel associated with the construction of the project about the presence of manatees in the area and the need to avoid collisions with manatees. All vessels associated with the project shall operate at 'no wake' speeds at all times while in shallow waters, or channels, where the draft of the boat provides less than three feet clearance of the bottom. Boats used to transport personnel shall be shallow draft vessels, preferably of the light-displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any workboat shall follow routes of deep water to the extent possible. Shore crews or personnel assigned to the disposal site for the workshift shall use upland road access if available. All personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act. The contractor shall be held responsible for any manatee harmed, harassed, or killed as a result of the construction of the project. If a manatee is sighted within 100 yards of the dredging area, appropriate safeguards would be taken, including suspension of dredging, if necessary, to avoid injury to manatees. The contractor shall keep a log of all sightings, collision, injuries, or killings of manatees during the contract period. Any manatee deaths or injuries will be immediately reported to the Corps of Engineers and the USFWS (Vero Beach Office).

(3) To minimize adverse impacts to sea turtles, the Corps will implement the terms and conditions applicable to Miami-Dade County as outlined in the USFWS Biological Opinion for Region III of the Coast of Florida Erosion and Storm Effects Study issued on October 24, 1996 and amended by letter dated March 1, 2001 (Appendix E). (Measures to minimize adverse effects to sea turtles are summarized below:

a. Nourished beaches would be plowed to a depth of at least 36 inches within one week following the completion of the entire beach nourishment (or sooner on completed sections) if sand compaction is greater than 500 cone penetrometer units.

b. Nourished beaches would be checked for compaction every 500 feet along the project area. One station shall be at the seaward edge of the dune/bulkhead line (when material is placed in this area); one station shall be located between the dune line and the high water line; and one station shall be located just landward of the mean high water line. At each station three readings would be made at 6, 12, and 18 inch depths three times (three replicates). If any two or more adjacent stations have compaction at the same depth greater than 500 cone penetrometer units, the area would be plowed to a depth of at least 36 inches immediately prior to April 1. This process would be completed for three consecutive years following project completion.

c. Nest relocation activities must begin 65 days prior to nourishment activities which occur within the nesting and hatching season (April 1 - November 30) or by April 1, whichever is later. Nest surveys and relocations shall continue through the end of the project or September 30, whichever is earlier.

d. Nest surveys and relocations would be conducted by personnel with prior experience and training in nest survey and relocation procedures, and with a valid Florida Fish and Wildlife Conservation Commission (FWC) permit.

e. Nests would be relocated between sunrise and 9 a.m. each day, and the relocation would be to a nearby hatchery in a secure setting where artificial lighting would not conflict with hatchling orientation.

f. In the event a turtle nest is dug up by beach construction activities, the contractor shall immediately notify the FWC permitted individual responsible for nest relocation so that the nest can be moved to the beach hatchery.

g. A report describing the actions taken to implement the terms and conditions shall be submitted to the USFWS within 60 days of completion of the proposed work for each year when activity has occurred. The report shall include the dates of actual construction activities, names and qualifications of personnel involved in nest surveys and relocation activities, descriptions and locations of the hatcheries, nest survey and relocation results and hatching success of the nests.

h. Nourished beaches would be surveyed for escarpments immediately after construction and prior to April 1, for 3 subsequent years. Any escarpments that exceed 18 inches in height and 100 feet length would be leveled by April 1.

i. Measures will be taken to reduce nighttime beach lighting including: eliminating extraneous lighting to an amount necessary for safe operations and safety of personnel.

j. Evaluation and monitoring of the effects of upland sand material will be evaluated both pre-construction and post-construction. This monitoring program will involve the analysis of nesting parameters such as nesting success, temperature, and sex determination, for turtle nest laid in the test beach project area. Nests will be relocated to a beach hatchery area for analysis. Data collected post construction will be compared to studies previously done by Nelson et al. (1996,1997,1998,1999) and Blair et al. (2000).

(4) Monitor turbidity at the discharge site. Should monitoring reveal turbidity levels above State standards, outside the allowable mixing zone, work would be suspended until turbidity levels return to within those standards.

(5) Artificial reefs would be constructed to mitigate for adverse impacts to hardbottom habitat due to the placement of the discharge pipelines.

(6) Benthic infaunal studies pre- and post-construction will be implemented. Species abundance and diversity will be analyzed prior to beach fill placement and monitored following placement to determine the effects of upland sand source fill on benthic infaunal communities.

6 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

6.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and a Draft Environmental Assessment, has been prepared and will be circulated for public review and comment. The project is in compliance with the National Environmental Policy Act.

6.2 ENDANGERED SPECIES ACT OF 1973

On June 19, 1998 the Corps submitted a Biological Assessment (BA) to the National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA), for a proposed test beach fill at Miami Beach using oolitic aragonite as the source of fill material. Since no dredging would occur in U.S. waters, the Corps had determined in the BA that the project would not adversely affect any listed species under their jurisdiction. In a letter dated July 15, 1998, the NMFS concurred with that determination. On June 5, 1998 the Corps submitted a BA to the U.S. Fish and Wildlife Service (USFWS) for the test beach fill using aragonite. In the BA the Corps determined that the proposed action may affect listed sea turtles under their jurisdiction and requested formal consultation. In letters dated April 22, 1999 to NMFS and April 29, 1999 to USFWS the Corps modified the proposed action increasing the length and volume of beach fill and changing the source of fill material from aragonite to a domestic upland sand source. This modification did not change the Corps previous affect determinations on listed species for NMFS or the USFWS. The NMFS concurred in a letter dated April 29, 1999. On March 1, 2001 the USFWS issued their Biological Opinion included in their draft Fish and Wildlife Coordination Act Report for the project (Appendix E). Refer to Appendix D for correspondence relating to ESA coordination. This project was fully coordinated under the ESA and is therefore, in full compliance with the Act.

6.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project has been coordinated with the U.S. Fish and Wildlife Service (USFWS). A draft Fish and Wildlife Coordination Act (FWCA) Report dated March 1, 2001 was submitted by the USFWS (refer to Appendix E). The recommendations of the USFWS have been given full consideration. There has been no change in the project design or the source of beach fill material since submittal of the CAR. This project is in full compliance with the Act.

6.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

(PL 89-665, the Archeology and Historic Preservation Act (PL 93-291), and executive order 11593) Archival research, field investigations, and consultation with the Florida State Historic Preservation Officer (SHPO), have been conducted in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. Refer to Section 4.13 for results of SHPO consultation. The project will not affect historic properties included in or eligible for inclusion in the National Register of Historic places. The project is in compliance with each of these Federal laws.

6.5 CLEAN WATER ACT OF 1972

The project is in compliance with this Act. Application for a Section 401 water quality certification has been submitted to the Florida Department of Environmental Protection. All State water quality standards would be met. A Section 404(b) evaluation is included in this report as Appendix B.

6.6 CLEAN AIR ACT OF 1972

No air quality permits would be required for this project. This project has been coordinated with U.S. Environmental Protection Agency (EPA) and is in compliance with Section 309 of the Act. (See Section 4.9) The draft EA was forwarded to EPA for their review.

6.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix C. Upon reviewing the draft EA, the state determined that, at this stage, the project was consistent with the Florida Coastal Zone Management Program. Final consistency will come with the issuance of the Water Quality Certification. Refer to letter dated August 2, 2002 from the Florida State Clearinghouse.

6.8 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of this project. This act is not applicable.

6.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This act is not applicable.

6.10 MARINE MAMMAL PROTECTION ACT OF 1972

Incorporation of the safe guards used to protect threatened or endangered species during beach disposal operations would also protect any marine mammals in the area, therefore, this project is in compliance with the Act.

6.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. This act is not applicable.

6.12 FEDERAL WATER PROJECT RECREATION ACT

The principles of the Federal Water Project Recreation Act, (Public Law 89-72) as amended, have been fulfilled by complying with the recreation cost sharing criteria as outlined in Section 2 (a), paragraph (2). Another area of compliance includes the public beach access requirement on which the renourishment project hinges (Section 1, (b)).

6.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

The project has been coordinated with the National Marine Fisheries Service (NMFS) and is in compliance with the act (refer to correspondence from NMFS in Appendix D).

6.14 SUBMERGED LANDS ACT OF 1953

The project would occur on submerged lands of the State of Florida. The project has been coordinated with the State and is in compliance with the act.

6.15 COASTAL BARRIER RESOURCES ACT & COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These acts are not applicable.

6.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to a public notice and other evaluations normally conducted for activities subject to the act. The project is in full compliance.

6.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. The project has been coordinated with the National Marine Fisheries Service and is in compliance with the act.

6.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

No migratory birds would be affected by project activities. The project is in compliance with these acts.

6.19 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

This act requires the preparation of an Essential Fish Habitat (EFH) Assessment and coordination with NMFS. The EFH Assessment was integrated within the EA and was coordinated with NMFS during coordination of the draft EA. Refer to NMFS letter dated June 21, 2002 and the Corps' response dated August 15, 2002 in Appendix D.

6.20 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The term "dumping" as defined in the Act (3[33 U.S.C. 1402](f)) does not apply to the disposal of material for beach nourishment. Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this EA have been evaluated under Section 404 of the Clean Water Act.

6.21 E.O. 11990, PROTECTION OF WETLANDS

No wetlands would be affected by project activities. This project is in compliance with the goals of this Executive Order.

6.22 E.O. 11988, FLOOD PLAIN MANAGEMENT

The project is in the base flood plain (100-year flood) and has been evaluated in accordance with this Executive Order. Refer to Dade County Beaches, Florida, Beach Erosion Control and Hurricane Protection, General Design Memorandum. Phase I, 1974. Project is in compliance.

6.23 E.O. 12898, ENVIRONMENTAL JUSTICE

The proposed action would not result in adverse human health or environmental effects, nor would the activity impact substance consumption of fish or wildlife. Project is in compliance.

6.24 E.O. 13089, CORAL REEF PROTECTION

The proposed action may affect U.S. coral reef ecosystems as defined in the Executive Order. Precautions would be implemented during construction to minimize impacts. Artificial reefs would be constructed to mitigate for any reef impacts associated with the placement of discharge pipelines. Section 4.4 outlines potential hardbottom impacts. The proposed project is in compliance.

7 LIST OF PREPARERS

This Environmental Assessment was prepared by the following personnel:

Preparer	Discipline	Role
Michael Dupes	Biology	Principal Writer
Jason Croop	Marine Biology	Associate Writer
Steve Blair	Marine Biology	Reef Impact Assessment
Thomas Birchett	Archeology	Historic Properties
Doug Rosen	Coastal Geology	Geotechnical Analysis

8 PUBLIC INVOLVEMENT

8.1 SCOPING AND DRAFT EA

A Notice of Intent (NOI) to prepare a Draft Environmental Impact Statement (DEIS) for a Test Beach Fill using a foreign source of carbonate sand appeared in the Federal Register on August 21, 1998. In addition, the NOI was mailed to interested and affected parties on October 7, 1998. A correction to this NOI was published in the Federal Register on October 27, 1998. This NOI was cancelled in the Federal Register on February 19, 1999. A new NOI for to prepare a DEIS for a Test Beach using a domestic upland sand source appeared on May 6, 1999 and was mailed to interested parties on May 18, 1999. This NOI was cancelled on May 16, 2002 after it was determined that there were no new significant issues and that an Environmental Assessment would be adequate. Copies of the NOI's and the transmittal letters can be found in Appendix D as well as copies of any letters of comment/response received. The draft EA was circulated for review and comment to the appropriate Federal, State and local agencies and other interested parties that requested a copy. A notice of availability of the draft EA dated May 21, 2002 was sent to all other known interested and affected parties.

8.2 AGENCY COORDINATION

The draft EA was coordinated with the following agencies: U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Florida State Clearinghouse, Florida State Historic Preservation Officer (SHPO), Florida Fish and Wildlife Conservation Commission, and the Florida Department of Environmental Protection.

8.3 COMMENTS RECEIVED

Letters of comment on the draft EA were received from the U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Florida State Clearinghouse, Florida Department of Environmental Protection and the South Florida Regional Planning Council. Copies of these letters can be found in Appendix D.

9 REFERENCES

Blair, S.M, D. Nelson, R. Cheeks, J. Hibler, T. Gross, P. Lutz, and J. Hoover. 2000. Evaluation of quartz and carbonate beach sand compatible sand on nest temperature and success parameters of Caretta caretta nests in Miami-Dade County, Florida: 1999 Project Summary Report. Dade County, Florida.

Blair, S., and B. Flynn. 1989. Biological Monitoring of Hardbottom Communities off Dade County Florida: Community Description. In Diving for Science 1989, Proceeding of the American Academy of Underwater Science, Ninth Annual Scientific Diving Symposium (Eds. Lang and Japp). Costa Mesa, California.

Coastal Planning & Engineering, Inc. August 1989. North Boca Raton Beach Restoration Project Preconstruction Environmental Monitoring. Vols. I and II. Prepared for City of Boca Raton, Florida. Coastal Planning & Engineering: Boca Raton, Florida.

Continental Shelf Associates, Inc. 1993. Coast of Florida Erosion and Storm Effects Study, Region III: Mapping and Classification of Hard Bottom Areas in Coastal Waters off Palm Beach, Broward, and Dade Counties. Final report for the U. S. Army Corps of Engineers, Jacksonville District, Jacksonville, Florida. Three individual county reports, 30 pp. each.

Continental Shelf Associates, Inc. 1984. Environmental Assessment of the Palm Beach County Erosion Control Program: Phase I: Ocean Ridge. Final report for the Palm Beach County Board of County Commissioners. 110 pp.

Continental Shelf Associates, Inc. 1985. Environmental Assessment of the Palm Beach County Erosion Control Program: Phase II: North Boca Raton. Final report for the Palm Beach County Board of County Commissioners. 114 pp.

Continental Shelf Associates, Inc. 1987. Environmental Assessment of the Palm Beach County Erosion Control Program: Phase III: Jupiter/Tequesta. Final report for the Palm Beach County Board of County Commissioners. 50 pp.

Courtenay, W. R., Jr., D. J. Herrema, M. J. Thompson, W. P. Azzinaro, and J. van Montfrans. 1974. Ecological Monitoring of Beach Erosion Control Projects, Broward County, Florida, and Adjacent Areas. Technical Memorandum 41, USACE, Ft. Belvoir, Virginia. 88 pp.

Deis, D. R., K.D. Spring, A.D Hart. 1992. Captiva Beach Restoration Project Biological Monitoring Program. Proceedings of the National Conference on Beach Preservation Technology, 1992.

Dickerson, D.D., and D.A. Nelson. 1989. Beachfront Lighting Issues Regarding Sea Turtles. Pp 135-141 in Proceedings of Beach Preservation Technology '89 held February 22-24, 1989 at Tampa Florida. Florida Shore and Beach Preservation Association.

Dodge, R., E. Proffitt, W. Raymond, J. Devlin. 1987. Description and Generalized Mapping of the Bathymetry and Benthic Biological Communities at the Site of the Proposed Sunny Isles, Dade County, Florida Beach Renourishment Project. Nova University Oceanographic Center, Dania, Florida

Dodge, Richard E., Steven Hess, and Charles Messing. January 1991. Final Report: Biological Monitoring of the John U. Lloyd Beach Renourishment: 1989. Prepared for Broward County Board of County Commissioners Erosion Prevention District of the Office of Natural Resource Protection. NOVA University Oceanographic Center: Dania, Florida. 62 pp. plus appendices.

Dompe, P. E. and D. M. Haynes. 1993. "Turbidity Data: Hollywood Beach, Florida, January 1990 to April 1992." Coastal & Oceanographic Engineering Department, University of Florida: Gainsville, Fla. UFL/COEL - 93/002.

Duane, D. B., and E. P. Meisburger. 1969. Geomorphology and Sediments of the Nearshore Continental Shelf, Miami to Palm Beach, Florida. USACOE Coastal Engineering Center, Technical Memorandum No. 29. 47 pp.

Florida Atlantic University and Continental Shelf Associates, Inc. 1994. An Assessment of the Effects of Recurrent Codium isthmocladum Blooms on the Reefs and Reef Fish Populations of Palm Beach and Northern Broward Counties, Florida. Final report for the Florida Marine Fisheries Commission, Tallahassee, Florida. 51 pp. plus appendices.

Florida Marine Research Institute (FMRI). 2002a. Green Turtle Nesting Data for Southeast Florida. Website accessed 9 May 2002: http://floridamarine.org/features/view_article.asp?id=7630.

Florida Marine Research Institute (FMRI). 2002b. Leatherback Nesting Data for Southeast Florida. Website accessed 9 May 2002: http://floridamarine.org/features/view_article.asp?id=8225.

Florida Marine Research Institute (FMRI). 2002c. Loggerhead Nesting Data for Southeast Florida. Website accessed 9 May 2002: http://floridamarine.org/features/view_article.asp?id=8242.

Flynn, B. 1992. Beach Nourishment, Sea Turtle Nesting, and Nest Relocation in Dade County, Florida. Proceedings of the 5th Annual National Conference on Beach Preservation Technology, St Petersburg, Florida 1992. pp 381-394.

Goldberg, W.M. 1985. Long Term Effects of Beach Restoration in Broward County, Florida, A Three Year Overview. Part I: Macrobenthic Community Analysis. Coral Reef Associates, Inc./ Florida International University, Miami, Florida. 20 pp.

Goldberg, W.M., P.A. McLaughlin, and S. Mehadevan. 1985. Long Term Effects of Beach Restoration in Broward County, Florida, A Three Year Overview. Part II: Infaunal Community Analysis. Coral Reef Associates, Inc./ Florida International University, Miami, Florida./Mote Marine Laboratory, Sarasota, Florida. 31 pp.

Goldberg, W. M. 1970. Some Aspects of the Ecology of the Reefs off Palm Beach County, Florida, with Emphasis on the Gorgonacea and Their Bathymetric Distribution. M.S. Thesis, Florida Atlantic University. 108 pp.

Goldberg, W. 1973. "The Ecology of the Coral-Octocoral Communities off the Southeast Florida Coast: Geomorphology, Species Composition, and Zonation." Bulletin of Marine Science 23:465-488.

Gorzelany, J.F., and W.G. Nelson. 1987. The Effects of Beach Nourishment on the Benthos of a Sub-tropical Florida Beach. Marine Environmental Research. 21:75-94.

Hackney, C.T., M.H. Posey, S.W. Ross, and A.R. Norris. 1996. A review and synthesis of data on surf zone fishes and invertebrates in the South Atlantic Bight and the potential impacts from beach renourishment. Report to the U.S. Army Corps of Engineers, Wilmington, North Carolina. 111 pp.

Herrema, D. J. 1974. Marine and Brackish Water Fishes of Southern Palm Beach and Northern Broward Counties, Florida. M.S. Thesis, Florida Atlantic University. 257 pp.

Jaap, W. C. 1984. The Ecology of the South Florida Coral Reefs: A Community Profile. U.S. Fish and Wildlife Service Report FWS/OBS - 82/08. 138 pp.

Lighty, R. G., I. G. MacIntyre, and R. Stuckenrath. 1978. "Submerged Early Holocene Barrier Reef South-east Florida Shelf." Nature (London) 276 (5683):59-60.

Marsh, G.A., P.R. Bowen, D.R. Deis, D.B. Turbeville, and W.R. Courtenay. 1980. "Evaluation of Benthic Communities Adjacent to a Restored Beach, Hallandale (Broward County), Florida," Vol. II, Ecological Evaluation of a Beach Nourishment Project at Hallandale (Broward County), Florida, MR 80-1(II), U.S. Army Corps of Engineers, Coastal Engineering Research Center.

Marszalek, D. S. 1978. Professional Engineering Services for Surveying and Monitoring of Marine Hardground Communities in Dade County, Florida. Final report for the USACE, Jacksonville District. Contract No. DACW17-77-C-0036.

Marszalek, D. S., and D. L. Taylor. 1977. Professional Engineering Services for Surveying and Monitoring of Marine Hardground Communities in Dade County, Florida. Initial report for the USACE, Jacksonville District. Contract No. DACW17-77-C-0036.

Meylan, A., B. Schroeder, and A. Mosier. 1995. Sea Turtle Nesting Activity in the State of Florida 1979-1992. Florida Marine Research Publications, Number 52. State of Florida Department of Environmental Protection, Florida Marine Research Institute. St. Petersburg, Fl. 51 pp.

Modde, T. 1980. "Growth and Residency of Juvenile Fishes Within a Surf Zone Habitat in the Gulf of Mexico." Gulf Research Report 6:377-385.

Modde, T., and S. T. Ross. 1981. "Seasonality of Fishes Occupying a Surf Zone Habitat in the Northern Gulf of Mexico." Fisheries Bulletin 78:911-922.

Nelson, W.G. 1985. Guidelines for Beach Restoration Projects: Part 1 Biological. Florida Sea Grant College.

Nelson, D.A. 1987. The use of tilling to soften nourished beach sand consistency for nesting sea turtles. Unpublished draft for U.S. Army Corps of Engineers, Jacksonville District.

Nelson, D.A., and D.D. Dickerson. 1989a. Effects of Beach Nourishment on Sea Turtles. In 1989 Proceedings of the Florida Shore and Beach Conference, Tampa Florida.

Nelson, D.A., and D.D. Dickerson. 1989b. Management implications of recent hatchling orientation research. Pp 129 in Proceedings of the Ninth Annual Workshop on Sea Turtle Conservation and Biology held 7-11 February 1989 at Jekell Island, Georgia. S.A. Eckert, K.L. Eckert, and T.H. Richardson, comp. NOAA-TM-NMFS-SEFC-232. Miami, Fl: Southeast Fisheries Center, National Marine Fisheries Service.

Nelson, W.G. 1989c. Beach Renourishment and Hardbottom Habitats: The Case for Caution. Proceedings: 1989 National Conference on Beach Preservation Technology. FSBPA. Tallahassee, Florida. 109-116.

Nelson D.A., S.M. Blair, R. Cheeks, P.L. Lutz, S.L. Milton, and T.S. Gross. 1996. Evaluation of Alternative Beach Nourishment Sands as Loggerhead Sea Turtle Nesting Substrates. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson D.A., S.M. Blair, T.S.Gross. 1998. Sex Ratios of Loggerhead Sea Turtle Nests Incubated in Alternative Beach Nourishment Sands, 1996. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson D.A., S.M. Blair, T.S.Gross. 1998. Sex Ratios of Loggerhead Sea Turtle Nests Incubated in Alternative Beach Nourishment Sands, 1997. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson D.A., S.M. Blair, T.S.Gross. 1999. Sex Ratios of Loggerhead Sea Turtle Nests Incubated in Alternative Beach Nourishment Sands, 1998. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson D.A., S.M. Blair, T.S.Gross. 2000. Sex Ratios of Loggerhead Sea Turtle Nests Incubated in Alternative Beach Nourishment Sands, 1999. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson D.A., S.M. Blair, T.S.Gross. 2000. Sex Ratios of Loggerhead Sea Turtle Nests Incubated in Miami Test Beach, 1999. U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

Nelson, W.G. 1985. Guidelines for Beach Restoration Projects. Part I - Biological. Florida Sea Grant College. SGC-76. 66 pp.

Peters, D. J., and W. G. Nelson. 1987. "The Seasonality and Spatial Patterns of Juvenile Surf Fishes of the Florida East Coast." Florida Scientist 50(2):85-99.

Raymond, B., and A. Antonius. 1977. Biological Monitoring Project of the John U. Lloyd Beach Restoration Project. Final report for Broward County Erosion Prevention District, Broward County, Florida.

Saloman, C.H., S.P. Naughton, J.L. Taylor. 1982. Benthic Community Response to Dredging Borrow Pits, Panama City Beach, Florida. U.S. Army Corps of Engineers, Coastal Engineering Research Center. Miscellaneous Report No. 82-3

Smith, N. P. 1981. "Upwelling in Atlantic Shelf Waters of South Florida." Florida Scientist 45:125-138.

Smith, N. P. 1983. "Temporal and Spatial Characteristics of Summer Upwelling Along Florida's Atlantic Shelf." Journal of Physical Oceanography 13(9):1,709-1,715.

South Atlantic Fishery Management Council (SAFMC). 1998. Final Habitat Plan for the South Atlantic Region: Essential Fish Habitat Requirements for Fishery Management Plans of the South Atlantic Fishery Management Council: The Shrimp Fishery Management Plan, The Red Drum Fishery Management Plan, The Snapper Grouper Fishery Management Plan, The Coastal Migratory Pelagics Fishery Management Plan, The Golden Crab Fishery Management Plan, The Spiny Lobster Fishery Management Plan, The Coral, Coral Reefs, and Live/Hard Bottom Habitat Fishery Management Plan, The Sargassum Habitat Fishery Management Plan, and the Calico Scallop Fishery Management Plan. SAFMC. Charleston, SC, 457 pp.

Spring, Keith D. "A Study of Spatial and Temporal Variations in the Nearshore Macrobenthic Populations of the Central Florida East Coast." A Thesis submitted to Florida Institute of Technology, Department of Oceanography and Ocean Engineering, Bio-Environmental Oceanography. June 1981.

U.S. Army Corps of Engineers. 1974. Phase I, General Design Memorandum, Beach Erosion Control and Hurricane Protection Study, Dade County, Florida.

U.S. Army Corps of Engineers. 1975. Final Environmental Impact Statement, Beach Erosion Control and Hurricane Surge Protection Project, Dade County, Florida.

U.S. Army Corps of Engineers. 1982. Survey Report and EIS Supplement, Beach Erosion Control and Hurricane Protection Study for Dade County, Florida, North of Haulover Park.

U.S. Army Corps of Engineers. 1995. Dade County, Florida Shore Protection Project, Design Memorandum, Addendum III, North of Haulover Park (Sunny Isles) Segment.

U.S. Army Corps of Engineers. 1995. Final Environmental Assessment, Second Periodic Nourishment, Sunny Isles and Miami Beach Segments, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida.

U.S. Army Corps of Engineers. 1996. Coast of Florida Erosion and Storm Effects Study, Region III, Feasibility Report with Final Environmental Impact Statement.

U.S. Army Corps of Engineers. 1997. Final Environmental Assessment, Second Periodic Nourishment, Surfside and South Miami Beach Segments, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida.

U.S. Army Corps of Engineers. 1998. Final Environmental Impact Statement, Modifications at Sunny Isles, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida.

U.S. Army Corps of Engineers. 2000. Final Environmental Assessment, Renourishment, at Miami Beach in the Vicinity of 63rd Street, Beach Erosion Control and Hurricane Protection Project, Dade County, Florida.

U.S. Environmental Protection Agency. 1992. Water Quality Protection Program for the Florida Keys National Marine Sanctuary: Phase I Report. Final report submitted to the Environmental Protection Agency under Work Assignment 3-225, Contract NO. 68-C8-0105 by Battelle Ocean Sciences, Duxbury, Massachusetts and Continental Shelf Associates, Inc., Jupiter, Florida.

U.S. Fish and Wildlife Service. 1997. Fish and Wildlife Coordination Act Report, Modifications to: Sunny Isles Beach Project, Dade County, Florida. September 1997.

Witherington, B.E. 1991. Orientation of hatchling loggerhead sea turtles at sea off artificially lighted and dark beaches. J. Exp. Biol. Ecol. Vol. 149, Pp 1-11.

Witherington, B.E. 1992. Behavioral responses of nesting sea turtles to artificial lighting. Herpetologica Vol. 48 No. 1 Pp 31-39.

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APPENDIX A - SAND SPECIFICATION

BEACH FILL

1. PAYMENT

Payment for sand fill shall be made on the basis of the quantity of sand placed within each Acceptance Section, as measured by the volume of sand within the template shown on the plans. The total quantity may be modified depending on the Mean Grain Size of the sand delivered, according to these specifications and the Bid Schedule. During placement and prior to measurement, the fill sand must have been flooded to consolidate the sand, according to these specifications. Acceptance Sections will not be accepted by the Government until all Mean Grain Size analysis and calculations has been completed for that Acceptance Section, verifying the Mean Grain Size of sand delivered, and thus the proper quantity of sand for that Mean Grain Size, as shown on the Bid Schedule.

2. ACCEPTANCE SECTIONS

Acceptance Sections shall be every 500 feet along the project beach.

3. SAND SOURCE

This project is a test fill for a domestic, upland source of sand. No offshore sand sources shall be an acceptable source.

4. SAND FILL MATERIAL

The Contractor is responsible for providing a source, delivery and spreading of beach compatible sand that meet the following specifications. The sand supplied shall be naturally created. The sand may be processed, but manufactured sand is not allowed. Contractor's offering blended sand shall submit a Blending Plan, showing the method the sand components will be thoroughly mixed before final placement on the beach. The project requires the contractor to bid sand with an average mean grain size of 0.30 mm or greater. The sand will be placed and shaped on the beach to fill the construction template shown in the plans, except as modified by the Mean Grain Size. Final beach fill shape shall parallel the construction template shown in the plans.

The project will benefit from placement of coarser sand, and incentive is provided to bid the coarsest sand available.

1) The project design beach must be built to the template shown on the plans (52 percent of the total quantity).
2) For the advance nourishment portion of the project fill (48 percent of the total quantity), Table 1 shows a reduced quantity incentive for an increased Average Mean Grain Size.

Placed volume reduction for coarser sand is available on the Bid Schedule, up to a maximum allowable Mean Grain Size of 0.55 mm. The contractor should select the

largest (coarsest) Mean Grain Size he can provide. **The contractor is warned that failure to achieve the grain size class selected on the Bid Schedule, by delivering a finer Mean Grain Size sand, will increase the quantity of sand required for delivery to the project.** Correspondingly, a coarser sand delivered than selected on the Bid Schedule will reduce the volume of sand required

TABLE 1
COARSE SAND INCENTIVES

	DESIGN BEACH		ADVANCE NOURISHMENT		
MEAN GRAIN SIZE (mm)	52% OF TOTAL QUANTITY	% Volume Reduction	48% OF TOTAL QUANTITY	% VOLUME REDUCTION	TOTAL QUANTITY CY
0.30 – 0.32	312,000	0%	288,000	0%	600,000
0.33 – 0.35	312,000	0%	239,040	17%	551,100
0.36 – 0.39	312,000	0%	210,240	27%	522,240
0.40 – 0.44	312,000	0%	190,080	34%	502,080
0.45 – 0.49	312,000	0%	178,560	38%	490,560
0.50 – 0.55	312,000	0%	172,800	40%	484,800

5. CHARACTER OF MATERIAL

The character of the sand to be supplied by the Contractor shall meet the following physical specifications:

- Composed of quartz and/or carbonate with no more than 20 percent sand of other mineralogical composition.

- The carbonate sand grains allowable under this specification are naturally occurring, durable and solid carbonate grains. Many carbonate grains have excessive internal pore space dramatically reducing the grains density and durability. Carbonate grains delivered under this specification shall be 90 percent durable and solid carbonate grains. Internal pore space shall not exceed 10 percent.

  Whole and broken mollusk shells from the beach environment are durable and solid carbonate grains. Due to the platy nature of shells and shell fragments, no more than 60% of the sand (quartz or carbonate) shall be whole or broken shell.

- Silt content (passing #200 sieve (.074mm)) of less than 5%.

• 99% of material must pass 3/8 inch sieve and shall contain no material larger than the 3/4 inch sieve.

• Average mean grain size greater than or equal to 0.30 mm and less than 0.55 mm.

• Phi Standard Deviation values from 0.50 phi to 1.75 phi.

• Free of debris, sharp rocks and pebbles, concrete rubble, clay, and organic material.

• Sand color shall be similar to the existing beach. Based on the Munsell Soil Color Chart, color must be within the range:

HUE of: 2.5 YR, 5 YR, 7.5 YR, 10 YR, 2.5 Y, 5 Y
CHROMA of: 1, 2, or 3
VALUE of: 6, 7, or 8.
This color specification eliminates strongly colored or dark sand.

6. SUBMITTALS

Sand source information that shall be submitted with the proposal is:

1) the name, location and physical address of the proposed sand source;
2) written evidence that the proposed sand source is permitted under local, State, and other authorities, as applicable, with a Letter of Commitment from the Sand Source;
3) a grain size distribution of the proposed sand source as determined and reported by a Certified Testing Laboratory. The grain size data shall supply all information required for grain size distribution data under GRAIN SIZE REPORTING requirements.
4) a 1 to 3 pound sample of the proposed fill material; and
5) evidence that the proposed sand source contains sufficient quantity of acceptable material for the construction of the work.

Samples shall be provided in sealed plastic containers, either jars or bags, clearly marked with the name of the Contractor, the name of the source and any other identifying information.

The submitted grain size distribution data and the sample of the proposed sand source (including its color and texture) shall be representative of the typical nature of the entirety of the proposed sand fill. The Government will retain the submitted documents and samples.

7. SAND FLOODING

If the sand is placed in a state that is not completely saturated by hydraulic placement, the Contractor must saturate the dry placed sand to effect consolidation equal to hydraulic

placement. No more than 100 cubic yards of sand at a time shall be placed on the beach without saturating. Enough water must be used to completely saturate the sand, not less than 100 gallons of water shall be available for each cubic yard of sand placement. Run off water shall be controlled so as not to run off the project limits on the upland side and not to run directly to the ocean forming gullies, eroding the fill sand.

8. CALCULATION OF AVERAGE MEAN GRAIN SIZE

The Mean Grain Size and Phi Standard Deviation shall be determined by Method of Moments Statistics calculated from sieve analysis of the proposed sand source. A Certified Testing Laboratory shall perform laboratory testing in accordance with ASTM – D422. The Method of Moments Statistics shall be calculated according to the instructions contained within this section.

Mean grain size and phi standard deviation are statistical measures of the textural character of a sample of sand, corresponding to the mean and standard deviation of a statistically normal population (example: sand grain sizes). Laboratory sieving of sand provides the data for calculation of the mean grain size and phi standard deviation. There are several methods of calculating these statistics. For the purposes of this contract, Mean Grain Size and Phi Standard Deviation shall be calculated by the Method of Moments. The method of calculation is included in this section. The Average Mean Grain Size refers to the average of the Mean Grain Sizes calculated for individual samples sieved in the laboratory. The Average Mean Grain Size shall be used to evaluate price and quantity incentives for this contract.

9. GRAIN SIZE REPORTING

The grain size distribution information shall be based upon ASTM – D422, using U.S. Standard sieve sizes 3/8", 4, 8, 16, 30, 40, 50, 70, 100, 140, 200, 230. Each sample test results shall be represented by a gradation curve and a frequency curve. All gradation curves shall be submitted on ENG Form 2087, sample appended to this section. All title information shall be filled out with project name, date, sample number, location sample obtained, unified soil classification, percent silt passing the No. 200 sieve (0.074mm), percent silt passing the No. 230 sieve (0.063mm) and Method of Moments Mean Grain Size and Phi Standard Deviation. Each curve shall state what Mean Grain Size class the sample meets, according to the Bid Schedule. Frequency curves shall show percent retained on vertical axis and grain size on horizontal axis. Frequency curves shall be identified by sample number and date and accompany the gradation curve. A tabulation of the laboratory results of weight retained, percent retained and cumulative percent retained on each sieve, by weight, shall be provided with each gradation curve. Samples from the sand source shall be numbered consecutively. Samples from the project site shall be identified with the Acceptance Section, numbered consecutively for each Acceptance section, and a station and range location.

10. CERTIFIED TESTING LABORATORY

Certified Testing Laboratory refers to a geotechnical testing laboratory qualified under ASTM E329-95c standards and certified by AASHTO (American Association of State Highway and Transportation Officials) National Voluntary Accreditation Program; or MMRL (AASHTO Materials Reference Laboratory accreditation; and personnel qualified by NICET (National Institute for Certification of Engineering Technicians).

11. MEAN GRAIN SIZE AND PHI STANDARD DEVIATION CALCULATION USING THE MOMENT METHOD

The equations for calculating the Mean Grain Size and Phi Standard Deviation using the moment method are as follows:

$$\textbf{Mean Grain Size} \quad M = \frac{\Sigma fx}{n}$$

$$\textbf{Phi Standard Deviation} \quad \sigma = \sqrt{\frac{\Sigma (x - M)^2}{n}}$$

Use of these equations to calculate the moment method values is illustrated in Table 2. Column A is the sieve size used, Column B is the corresponding sieve opening in millimeters, and Column C is the sieve opening in phi. The phi values are used in the calculation.

Sieve analysis measures the percent retained on each sieve size by weight (Column D). Column E (x) is the midpoint value in phi between adjacent sieves. Column F (f) is the percent retained by the smaller of adjacent sieves. Column G is the product of Column E and F (x * f). The sum of the values in Column F is n, sum of the percent retained on the smallest sieve used. This value will generally be less than 100%, as some fine material passes through all the screens. The sum of the values in Column G is Σfx, and its division by n produces the mean grain size in phi units of measure. The millimeter (mm) value is calculated as follows:

$2^{-phi} = mm$ Example: $2^{-1.25\,phi} = 0.42$ mm

Columns H and J are used to calculate the Phi Standard Deviation (σ) value of the material. If a sieve size is not used in the testing process it should be completely eliminated from the calculation table.

12. QUALITY CONTROL SAMPLING

The Contractor shall perform sampling that includes no less sample collection than described in the following plan. The Contractor shall conduct all testing in a location accessible to government inspectors. The Contractor shall include the sampling and testing procedure in his Contractor's Quality Control Plan for government review and acceptance within ten days of notification of acceptance of Bid. The Quality Control Plan shall include the name, address and point of contact for the Certified Testing Laboratory to be used for all grain size analysis. The location of the testing facility to be

Table 2

CALCULATION OF MOMENT METHOD FOR MEAN GRAIN SIZE AND PHI STANDARD DEVIATION

A	B	C	D	E	F	G	H	I
U.S. STANDARD SIEVE	GRAIN SIZE mm	GRAIN SIZE PHI	CUMULATIVE PERCENT RETAINED*	* Cumulative Percent Retained is example results of laboratory sieving of a sand sample.				
				x	f	fx	$(x-M)^2$	$f(x-M)^2$
3/4	19.00	-4.25	0.0%					
				-3.75	0.9%	-0.034	28.084	0.253
3/8	9.51	-3.25	0.9%					
				-2.75	3.8%	-0.105	18.498	0.703
4	4.76	-2.25	4.7%					
				-1.75	4.7%	-0.082	10.901	0.512
8	2.38	-1.25	9.4%					
				-0.75	9.5%	-0.071	5.298	0.503
16	1.19	-0.25	18.9%					
				0.25	10.5%	0.026	1.694	0.178
30	0.595	0.75	29.4%					
				1.00	4.5%	0.045	0.303	0.014
40	0.420	1.25	33.9%					
				1.50	5.3%	0.080	0.002	0.000
50	0.297	1.75	39.2%					
				2.00	9.0%	0.180	0.203	0.018
70	0.210	2.25	48.2%					
				2.50	12.3%	0.307	0.899	0.111
100	0.149	2.75	60.5%					
				3.00	24.8%	0.744	2.098	0.520
140	0.105	3.25	85.3%					
				3.50	10.6%	0.371	3.815	0.404
200	0.074	3.76	95.9%					
				3.88	1.1%	0.043	5.417	0.060
230	0.063	4.00	97.0%					
SUM				n=	97.0%			
SUM				Σ=		1.50		3.276
MEAN GRAIN SIZE (PHI)				**M(phi) =**		**1.55**		
MEAN GRAIN SIZE (mm)				**M(mm) =**		**0.34**		
PHI STANDARD DEVIATION				**σ=**				**1.84**

used for this contract shall also be included in the Quality Control Plan. Gradation test results shall be turned in daily with the daily quality control reports. Each sample collected shall be approximately one pound in weight and obtained from a single location. **All laboratory test results shall be reported to the Government.**

Sampling at the Sand Source

Sand samples for laboratory testing shall be collected at the sand source at the rate of one sample for every 2000 cubic yards of sand to be transported. Sampling and testing shall be completed before the sand is transported to the project site, and shall be representative of the sand being delivered to the project. Each day's samples Mean Grain Size and Phi Standard Deviation shall be averaged and the running average recorded on the gradation curve, along with the individual sample Mean Grain Size and Phi Standard Deviation. A new average shall be started each day. The Average Daily Mean Grain Size shall be used as an indicator for the Mean Grain Size for the sand proposed on the Bid Schedule and being delivered to the project. No individual sample Mean Grain Size shall be less than 0.25 mm. Any materials not meeting the Mean Grain Size requirements shall not be transported to the project site. Any materials not meeting the Contractor's Bid Mean Grain Size delivered to the project site shall fall into the lower Mean Grain Size class, and appropriately more sand shall be delivered.

Sampling at the Project Site

Sand samples for laboratory testing shall be collected at the project site. Sand samples shall represent the fill material only, avoiding existing beach sand below the project fill. Sand samples shall be collected from each beach fill Acceptance Section. Sand samples shall be collected at the rate of one sample representing 500 cubic yards of sand delivered. This represents approximately 100 samples taken per 500 foot Acceptance Section. The samples shall be collected on a regular sampling grid covering the entire Acceptance Section, and the location recorded on the gradation curve. The plan of beach sampling shall be submitted with the Contractor's Quality Control Plan. All sample collection in an Acceptance Section shall be distributed temporally over the entire filling operation. Half of the samples shall be collected during filling of the Acceptance Section, when the fill is approximately less than half of the final grade. The second half of the samples shall be taken from the surface of the completed Acceptance Section. Samples shall not be collected from the surface, but 6 inches below the ground surface. Before an Acceptance Section is surveyed for final payment and accepted by the government, all sample laboratory analyses shall be completed and submitted to the Government. All individual sample Mean Grain Size and Phi Standard Deviation shall be tabulated. The tabulation shall include sample identifying information including Acceptance Section, sample number and date. The Average Mean Grain Size and Average Phi Standard Deviation for each Acceptance Section shall be calculated from and indicated on the tabulation sheet. The Average Mean Grain Size from the sample analysis for each Acceptance Section shall be compared to the Bid Schedule Mean Grain Size class, and verify that the appropriate quantity of sand has been delivered for the

Mean Grain Size of the sand in that Acceptance Section. The survey of the Acceptance Section will verify the quantity of sand delivered. **The total quantity of sand in an Acceptance Section shall match the quantity shown on the Bid Schedule for the Mean Grain Size class of sand indicated by the Average Mean Grain Size of sand delivered to that Acceptance Section.**

13. PERMITS

The Contractor shall be responsible for obtaining all applicable permits for the sand source. As part of the proposal, the contractor shall submit evidence satisfactory to the Government that the sand source to be used for the project is permitted by local, State, and Federal authorities, as applicable. The Contractor is likewise responsible for obtaining all applicable permits and licenses for the transport of equipment and material undertaken as part of the work.

The Government shall obtain permits for the placement of the fill sand along the project beach area. By acceptance of the contract, the Contractor agrees to abide by all applicable conditions of the permits.

14. ENVIRONMENTAL QUALIFICATIONS AND ENVIRONMENTAL SAMPLING

GENERAL INFORMATION

It is important that any material to be used for a Dade Co. sand borrow source be considered to be as clean as what exists on Dade beaches or is normally used for playground quality sand. A Phase I HTRW (Hazardous Toxic and Radioactive Waste) Evaluation to meet the requirements of ASTM E-1527-97 shall be performed on the borrow source material. If the borrow site contains HTRW materials or is suspected of containing hazardous materials, fissionable materials, environmental contaminants or otherwise toxic materials it shall not be used as a borrow source. After the Notice to Proceed is issued, the Contractor shall submit an Environmental Sampling Plan, which will include the Phase 1 HTRW report. Approval of the Plan will not relieve the Contractor of his responsibility to document all potential sources of contamination of the borrow material, preexisting conditions in and around the borrow site, and to avoid contaminating any portion of the beach placement area with substandard material. Although an Environmental Sampling Plan needs to be submitted, actual environmental sampling may not be necessary. The Government will make the determination on the need for the Contractor to conduct environmental sampling and analysis at any point in time during the project, based on the information that is provided, and inspections of the borrow area and beach for the duration of the project.

The sand fill material shall not contain radioactive content, total recoverable petroleum hydrocarbons (TRPH), heavy metals (As, Ba, Cd, Cr, Hg, Pb, Se), volatile halogenated organics, polycyclic aromatic hydrocarbons, or other contaminants at levels in excess of those measured within the natural occurring beach sediments of the work area. The Contractor shall be responsible for obtaining all applicable permits and licenses for the extraction, transport, and placement of the sand fill material.

If environmental sampling is determined to be necessary by the Government, Contractor will be directed to conduct sampling and provide laboratory results on all criteria determined to be necessary. The laboratory results/report (environmental sampling report) will be provided within 2 weeks after the Government approves the plan and notifies the Contractor to conduct the sampling. The report shall include, but not be limited to, sample locations with coordinates, project drawings with the sample locations, dates and times of sampling, criteria that was tested for along with the method detection limits for each criteria, summary statement of the test results, etc. An adequate amount of the samples shall be collected and saved, in case additional analyses are needed.

The Environmental Sampling Plan shall be in accordance with, but not be limited to, the following:

a. Phase 1 HTRW Report.

b. Project drawings of the borrow area with proposed sampling locations shown on the drawings.

c. Information on the certified laboratory or laboratories (names, addresses, and phone numbers, points of contact, etc) that would be utilized to conduct the testing/analysis.

d. Methodologies and procedures for sampling and laboratory analysis.

GENERAL REQUIREMENTS FOR BORROW SOURCES:

As stated above, it is important that any material to be used for Dade County sand borrow source be considered to be as clean as what exists on Dade County beaches. A Phase I Hazardous Toxic and Radioactive Waste (HTRW) Evaluation to meet the requirements of ASTM E 1527 **shall be performed** by the Contractor on the borrow source material. If the borrow site contains HTRW materials or is suspected of containing hazardous materials, fissionable materials, environmental contaminants or otherwise toxic materials it shall not be used as a borrow source. Materials passing these evaluation criteria will be tested as provided below, if deemed necessary by the Government based on inspections of the borrow site material and beach for the duration of the project.

REQUIREMENTS FOR RADIOACTIVE ISOTOPES:

Testing for radioactive isotope is only necessary if the source of material is from non-silicate sands, phosphate mine tailings or from other suspected source(s), which potentially have unacceptable radiation levels. Testing radiation levels and radioactivity content shall be measured for the borrow material and for beach area. The borrow area and the beach placement area shall be surveyed in a pattern approved by the Government as described below. The background radioactivity and radiation levels (milli-roentgens/hour) of the borrow area vs. the beach site shall be compared. The levels of contaminant (radioactivity content in pico-curies/gram) in borrow material cannot exceed the mean levels existing at the beach placement area. If radioactivity levels of the source material exceed the mean naturally occurring radiation levels at the beach area, the site shall not be used as a borrow source. These radiological surveys and analysis shall consist of the following:

(1) Radiation surveys are to be taken at the beach and borrow sites. The radiation levels shall be presented in graphical and tabular form. These surveys shall be taken at waist level. Additionally, samples from the beach and borrow site shall be analyzed for radioactivity levels and be reported in pico-curies per gram. The measurements shall also fall within 1 standard deviation or suspect high values will be determined to be the most conservative representation of the results. The results of the radioactivity (pico-curies per gram) shall be reported in graphic and tabular form.

(2) The resulting beach background radiation level shall not be increased by more than 20 micro-roentgens/hour. This is to be determined by gamma radiation surveys (with the probe at waist level) taken both before and after the beach material placement.

(3) Gamma spectroscopy analysis for Radium 236 shall be performed at the beach site and at the potential borrow site. The placement of borrow material shall not allow the resulting composite radioactivity at the beach (determined by the gamma spectroscopy) to increase by more than 5 pico-curies/gram.

(4) Methodology for radioactivity content to be used for individual sample analysis shall be EPA Method 9310 for alpha and beta emissions.

(5) Methodology for gamma spectroscopy analysis shall be submitted by the Contractor and approved by the Contracting Officer.

(6) The Contractor shall provide reports to the CO/COR demonstrating their evaluation of the above criteria and provide all data including all radiation values taken.

REQUIREMENTS FOR ENVIRONMENTAL CONTAMINANTS:

If deemed necessary by the Government based on reviews of the information submitted and inspections of the borrow material and beach for the duration of the project, the Contractor shall provide reports to the Government demonstrating their evaluation of the below criteria and provide all data including all chemical values determined. The data shall be provided in graphical and tabular format. It is anticipated that background level of contaminants for Dade County beaches is essentially zero or below detection limits.

Should contaminants be detected in borrow material the levels of contaminant in borrow material cannot exceed the mean levels existing at the beach placement area in samples taken as described below. These measurements will consist of the following chemical testing of the borrow material and elutriates:

(1) Total Recoverable Petroleum Hydrocarbons (TRPH), EPA 9071A or EPA 8440

(2) Heavy metals (As, Ba, Cd, Cr, Hg, Pb, Se), EPA Method 3051 (Use graphite furnace method for each metal except Hg which has own method)

(3) Volatile Halogenated Organics (Cl-, Br-), EPA Method 8021A

(4) Polycyclic Aromatic Hydrocarbons (BTEX), EPA Method 8021A

(5) Elutriate Preparation shall be by the method provided in EPA/CE 81-1. Testing for all above contaminants shall be performed on elutriates.

If contaminant levels of the borrow material exceed the mean naturally occurring contaminant levels at the beach area, the site shall not be used as a borrow source. The measurements shall also fall within 2 standard deviation or suspect high values will be determined to be the most conservative representation of the results. Elutriate values shall be compared to State water quality standards to determine whether runoff will violate State standards.

SAMPLING LOCATIONS FOR ENVIRONMENTAL CONTAMINANTS:

Samples to be taken for the above requirements shall be taken every 1,000 feet as needed in the beach placement area, for representative beach quality samples, and in spots considered to be representative of every 50,000 cubic yards of the borrow material at the borrow site. Representative samples from all sites shall be taken in a pattern and locations approved by the Contracting Officer.

APPENDIX B - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION

PROPOSED TEST FILL AT MIAMI BEACH USING A DOMESTIC UPLAND SAND SOURCE DADE COUNTY BEACH EROSION CONTROL AND HURRICANE PROTECTION PROJECT MIAMI-DADE COUNTY, FLORIDA

I. Project Description

a. Location. The project is located on the southeast Florida coast within Miami-Dade County. The proposed location for the test fill is in Miami Beach between DNR monuments R-36 and R-47. The proposed work will be performed as a part of the Dade County Beach Erosion Control and Hurricane Protection Project. Refer to Location Map, Figure 1, in the Environmental Assessment (EA).

b. General Description. The proposed action consists of constructing a 205-foot wide berm along approximately 1.5 miles of shoreline using domestic upland sand as the source of beach fill.

c. Authority and Purpose. Initial authorization came from the Flood Control Act of 1968 authorization of the Beach Erosion Control and Hurricane Protection (BEC & HP) Project for Dade County, Florida (see Figure 1, Location Map). In addition, Section 69 of the 1974 Water Resources Act (P.L. 93-251 dated 7 March 1974) included the initial construction by non-Federal interests of the 0.85-mile segment along Bal Harbour Village, immediately south of Bakers Haulover Inlet. The authorized project, as described in HD 335/90/2, provided for the construction of a protective/recreational beach and a protective dune for 9.3 miles of shoreline between Government Cut and Baker's Haulover Inlet (encompassing Miami Beach, Surfside and Bal Harbour) and for the construction of a protective/recreational beach along the 1.2 miles of shoreline at Haulover Beach Park. The Supplemental Appropriations Act of 1985 and the Water Resources Development Act of 1986 (Public Law 99-662) provided authority for extending the northern limit of the authorized project to include the construction of a protective beach along the 2.5 mile reach of shoreline north of Haulover Beach Park (Sunny Isles) and for periodic nourishment of the new beach. This authority also provided for the extension of the period of Federal participation in the cost of nourishing the authorized 1968 BEC & HP Project for Dade County, which covered 10.5 miles of shoreline extending from Government Cut north to the northern boundary of Haulover Beach Park, from 10 years to the 50-year life of the project.

Nourishment of Miami-Dade County Beaches has become a necessity to provide storm protection. The purpose of the project is to prevent or reduce loss of public beach front to continuing erosional forces and to prevent or reduce periodic damages and potential risk to life, health, and property in the developed lands adjacent to the beach.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material.

Material suitable for beach placement must meet the following specifications:

- Composed of quartz and/or carbonate with no more than 20 percent other constituents.
- Average mean grain size greater than or equal to 0.30 mm and less than 0.55 mm.
- Silt content (passing #200 sieve (.074mm)) of less than 5 percent.
- 99 percent of the material must pass 3/8 inch sieve and sand shall contain no material larger than the 3/4 inch sieve.
- Phi Standard Deviation values from 0.50 phi to 2.00 phi.
- Free of debris, sharp rocks and pebbles, concrete rubble, clay and organic material.
- Sand color will be similar to the existing beach. Based on the Munsell Soil Color Chart, color must be within the following range: HUE of 2.5 YR, 5 YR, 7.5 YR, 10 YR, 2.5 Y, 5 Y with a CHROMA of 1, 2, or 3 and a VALUE of 6, 7, or 8. This color specification eliminates strongly colored or dark sand.

(2) Quantity of Material. The quantity of material needed to construct the 1.5-mile length of beach is estimated at 600,000 cubic yards.

(3) Source of Material. The exact source of the upland sand for the test beach would be determined during the procurement process. Sand sources proposed by contractors would have to meet a set of generic sand specifications and pass a screening process for sand characteristics and potential environmental impacts. The sand specification that will be used can be found in Appendix A of the EA

e. Description of the Proposed Construction Site.

(1) Location. The proposed beach fill would be placed along the Atlantic shoreline in northern Miami Beach between DEP monuments R-36 and R-47 (EA Figures 2 and 3).

(2) Size. The proposed fill would be approximately 1.5 miles in length with a berm width of 205 feet measured from the erosion control line (ECL).

(3) Type of Site. The site for disposal of the sand material is a segment of eroded, sandy, recreational beach and inshore seabed.

(4) Type of Habitat. The beach disposal area consists of a currently eroding carbonate and quartz sand beach and inshore seabed.

(5) Timing and Duration of Dredging. The exact timing of nourishment is not known. It is anticipated that construction will occur during 2002 or 2003.

f. Description of Disposal Method. It is anticipated that the material would be transported by ocean going vessel (dredge, barge, etc.) to a pumpout facility located offshore of the beach fill area. The material would then be pumped onto the beach and graded using construction equipment to achieve the desired construction profile.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The beach fill would be constructed with a berm elevation of +9.0 feet mean low water and a width of 205 feet from the ECL. The construction slope of the beach fill would be 1 vertical on 15 horizontal (EA Figures 2 and 3).

(2) Type of Fill Material. The material to be used as beach fill will be a quartz and/or carbonate sand from an upland sand source that meets the requirements of the sand specification (EA Appendix A).

(3) Dredge/Fill Material Movement. The fill material will be subject to erosion by waves with the net movement of fill material to the south.

(4) Physical Effects on Benthos. Some benthic organisms that are not mobile may be may be covered by the beach fill. Recolonization soon after project completion is expected to replace those organisms that do not survive project construction. It is anticipated that no long-term adverse impacts will occur.

b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. During beach fill operations turbidity will increase temporarily in the water column adjacent to the project shoreline. The increased turbidity will be short-

term; therefore fill placement will have no long-term or significant impacts, if any, on salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, nutrients or eutrophication.

(2) Current Patterns and Circulation. Net movement of water is from the north to the south. The project will have no significant effect on existing current patterns, current flow, velocity, stratification, or the hydrologic regime in the area.

(3) Normal Water Level Fluctuations and Salinity Gradients. Mean tidal range in the project area is 3.5 feet with a spring tide range of approximately 4.1 feet. Salinity is that of oceanic water. Fill placement will not affect normal tide fluctuations or salinity.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There may be a temporary increase in turbidity levels in the project area along the beach fill site during discharge. Turbidity will be short-term and localized and no significant adverse impacts are expected. State water quality standards for turbidity outside an allowable mixing zone would not be exceeded.

(2) Effects on the Chemical and Physical Properties of the Water Column. The sea floor, at this location, is characterized by a sandy beach and inshore seabed. There would be little, if any adverse effects to chemical and physical properties of the water as a result of placing clean beach compatible sand on the beach.

(a) Light Penetration. Some decrease in light penetration may occur in the immediate vicinity of the beach fill area. This effect will be temporary, limited to the immediate area of construction, and will have no adverse impact on the environment.

(b) Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project due to the high energy wave environment and associated adequate reaeriation rates.

(c) Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens are expected to be released by the project.

(d) Aesthetics. The aesthetic quality of the water in the immediate area of the project will be reduced during construction due to increased turbidity. This will be a short-term and localized condition. The placement of clean beach compatible sand on an erosive beach will likely improve the aesthetic quality of the immediate area.

(3) Effects on Biota.

(a) Primary Productivity and Photosynthesis. Primary productivity is not a recognized, significant phenomenon in the surf zone, where a temporarily increased level of suspended particulates will occur. There will be no effect on the nearshore productivity as a result of the proposed beach fill.

(b) Suspension/Filter Feeders. An increase in turbidity could adversely impact burrowing invertebrate filter feeders within and adjacent to the immediate construction area. It is not expected that a short-term, temporary increase in turbidity will have any long-term negative impact on these highly fecund organisms.

(c) Sight Feeders. No significant impacts on these organisms are expected as the majority of sight feeders are highly motile and can move outside the project area.

d. Contaminant Determinations. The upland sand that will be used as beach fill material will not introduce, relocate, or increase contaminants at the fill area. The material would be clean sand meeting the sand specification (EA Appendix A) and compatible with the existing beach.

e. Aquatic Ecosystem and Organism Determinations. The upland sand that will be placed on the beach is similar enough to the existing substrate so that no impacts are expected. The materials meet the exclusion criteria, therefore, no additional chemical-biological interactive testing will be required.

(1) Effects on Plankton. No adverse impacts on autotrophic or heterotrophic organisms are anticipated.

(2) Effects on Benthos. The beach fill will bury some benthic organisms. Benthic organisms found in the intertidal areas along the project beach are adapted for existence in an area with considerable substrate movement, thus most will be able to burrow up through the fill material. Recolonization is expected to occur within a year after construction activities cease. No adverse long-term impacts to non-motile or motile benthic invertebrates are anticipated. Placement of the discharge pipeline across the nearshore hardbottom will impact a portion of the benthic community. Any impact to the hardbottom community as a result of placing the pipeline will be mitigated as discussed in Section 4.4.1 in the EA.

(3) Effects on Nekton. No adverse impacts to nektonic species are anticipated.

(4) Effects on the Aquatic Food Web. No adverse long-term impact to any trophic group in the food web is anticipated.

(5) Effects on Special Aquatic Sites.

(a) Hardground and Coral Reef Communities. There are no hardground or coral reef communities located in the immediate nearshore area that would be impacted by beach fill activities. A discharge pipeline used to pump the sand to the beach will be placed across the nearshore hardbottom habitat (EA figure 2). Any impacts to the hardbottom community would be appropriately mitigated by constructing an artificial reef. Section 4.4.1 in the EA offers a more detailed discussion on hardbottom impacts and mitigation.

(6) Endangered and Threatened Species. There will be no significant adverse impacts on any threatened or endangered species or on critical habitat of any threatened or endangered species. Section 4.3 in the EA discusses measures that will be implemented to protect endangered and threatened species.

(7) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, or wading birds, or wildlife in general are expected.

(8) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions are discussed elsewhere in this 404(b) evaluation and in the EA for this project (refer to Sections 4.0 and 5.0 in the EA).

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. Clean sand, compatible with the existing beach, would be placed on the beach. This will not cause unacceptable changes in the mixing zone water quality requirements as specified by the State of Florida's Water Quality Certification permit procedures. No adverse impacts related to depth, current velocity, direction and variability, degree of turbulence, stratification, or ambient concentrations of constituents are expected from implementation of the project.

(2) Determination of Compliance with Applicable Water Quality Standards. Because of the inert nature of the material to be to be used as beach fill, Class III water quality standards will not be violated.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supplies. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Fishing in the immediate construction area will be prohibited during construction. Otherwise, recreational and commercial fisheries will not be impacted by the implementation of the project.

(c) Water Related Recreation. Beach/water related recreation in the immediate vicinity of construction will be prohibited during construction activities. This will be a short-term impact.

(d) Aesthetics. The existing environmental setting will not be adversely impacted. Construction activities will cause a temporary increase in noise and air pollution caused by equipment as well as some temporary increase in turbidity. These impacts are not expected to adversely affect the aesthetic resources over the long term and once construction ends, conditions will return to pre-project levels.

(e) Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. No such designated sites are located within the project area.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. There will be no cumulative impacts that result in a major impairment in water quality of the existing aquatic ecosystem resulting from the placement of fill at the project site.

h. Determination of Secondary Effects on the Aquatic Ecosystem. There will be no secondary impacts on the aquatic ecosystem as a result of the dredging.

III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

a. No significant adaptations of the guidelines were made relative to this evaluation.

b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States. Further, no less environmentally damaging practical alternatives to the proposed actions exist. To test the suitability of upland sand sources, the borrow areas proposed by the contractor will be used for this project. In addition, the impacts of using other sources on cultural resources, protected species, and other environmental factors would likely be equal to or greater than the impacts of the proposed action. The no action alternative would allow the present condition of the shoreline to continue and would not provide the benefits needed for storm damage protection.

c. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable State water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

d. The disposal of fill material for beach renourishment will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended. Standard conditions for monitoring and relocating turtle nests would be employed

e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

f. Appropriate steps have been taken to minimize the adverse environmental impact of the proposed action. The material proposed as beach fill has low silt content, therefore, turbidity due to silt will be low when discharging. Turbidity will be monitored so that if levels exceed State water quality standards of 29 NTU's above background, the contractor will be required to cease work until conditions return to

normal. In the vicinity of reef and other hard grounds, measures would be taken to minimize sediment deposition on sensitive reef organisms.

g. On the basis of the guidelines, the proposed dredging and disposal sites are specified as complying with the requirements of these guidelines.

APPENDIX C - COASTAL ZONE MANAGEMENT CONSISTENCY

FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES

PROPOSED TEST FILL AT MIAMI BEACH
USING A DOMESTIC UPLAND SAND SOURCE
DADE COUNTY BEACH EROSION CONTROL
AND HURRICANE PROTECTION PROJECT
MIAMI-DADE COUNTY, FLORIDA

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed plans and information have been submitted to the state in compliance with this chapter.

2. Chapters 186 and 187, State and Regional Planning. These chapters establish the State Comprehensive Plan, which sets goals that articulate a strategic vision of the State's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project has been coordinated with various Federal, State and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the shorefront development and infrastructure.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed action involves placing beach compatible material from an upland sand source onto an eroding beach as a protective means for residents, development and infrastructure located along the Atlantic shoreline within the community of Miami Beach in Miami-Dade County. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed beach renourishment would create increased recreational beach and potential sea turtle nesting habitat. No seagrass beds or hardgrounds are located within the area proposed to receive fill. The proposed project would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership, this chapter does not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project area does not contain any state parks or aquatic preserves. The project is consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Historic Property investigations were conducted in the project area. No known historic properties are located on the segment of beach to be renourished. The SHPO concurred with the Corps determination that the proposed project will not adversely affect any significant cultural or historic resources. The project will be consistent with the goals of this chapter.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed beach nourishment would protect the beach. The larger beach, as a result of this project, will attract tourists by providing additional space for recreation and more protection to recreational facilities along the beach. This would be

compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

9. Chapters 334 and 339, Public Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed beach fill may cause a temporary short-term impact to infaunal invertebrates from increased turbidity and/or direct burial of these organisms. However, these organisms are highly adapted to the periodic burial by sand in the intertidal zone. These organisms are highly fecund and are expected to return to pre-construction levels within 6 months to one year after construction. No adverse impacts to marine fishery resources are expected. It is not expected that sea turtles would be significantly impacted by this project. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Florida Fish and Wildlife Conservation Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions, which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project will have no effect on freshwater aquatic life or wild animal life.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications will prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development.

Response: The proposed renourishment project will not have any regional impact on resources in the area. Therefore, the project is consistent with the goals of this chapter.

16. Chapter 388, Arthropod Control. This chapter provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project will not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: A Draft Environmental Assessment addressing project impacts has been prepared and will be coordinated with the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. Water Quality Certification will be sought from the State prior to construction. The project complies with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; therefore, this chapter does not apply.